799


# GAS JOURNAL

**LIGHT ✦ HEAT ✦ POWER ✦ BYE-PRODUCTS**

(Founded in 1849 as the "Journal of Gas Lighting.")

VOL. CXC. No. 3500.] LONDON, JUNE 18, 1930. [82ND YEAR. PRICE 1s.



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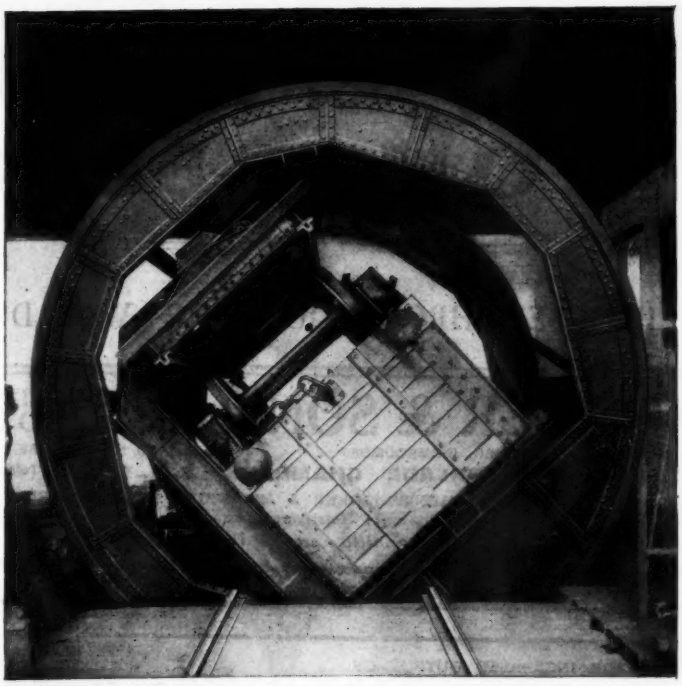

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Services, branching out from the street main, are usually laid under curbing, sidewalks, roads, walls, lawns and other forms of permanent construction where access for reconditioning or replacement is not only a considerable expense to the gas or water company, but a source of disturbance and annoyance to the consumer.

Services, moreover, are frequently laid in proximity to electric lines where stray currents lead to electrolysis. They are also laid in streets and alleys where ashes and refuse give rise to a more rapid rate of corrosion. As this small-sized pipe has thinner walls to start with, it is less able to withstand these corrosive attacks than in the case of larger, heavier-walled lines.

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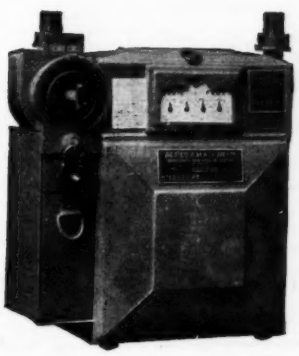

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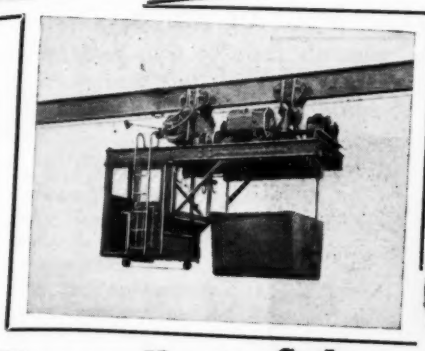

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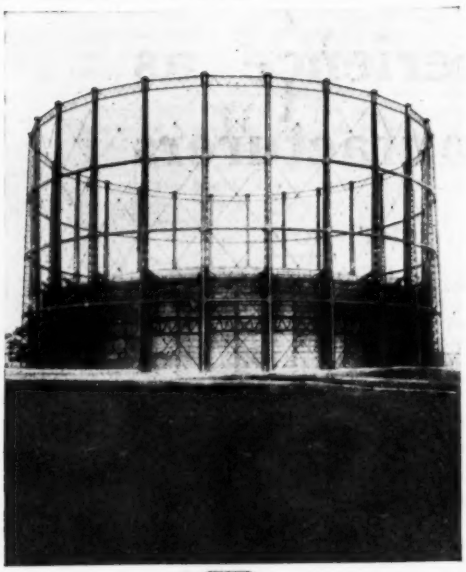

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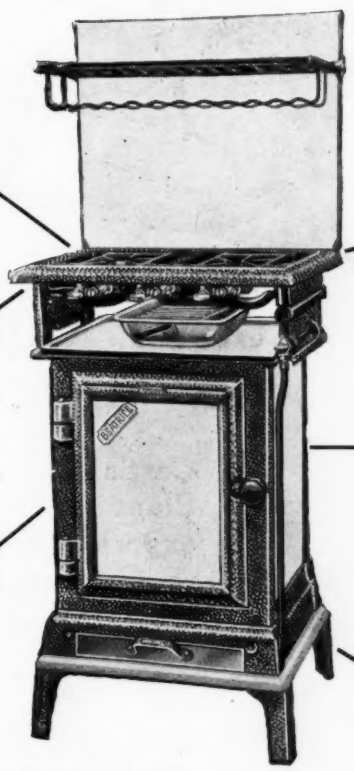

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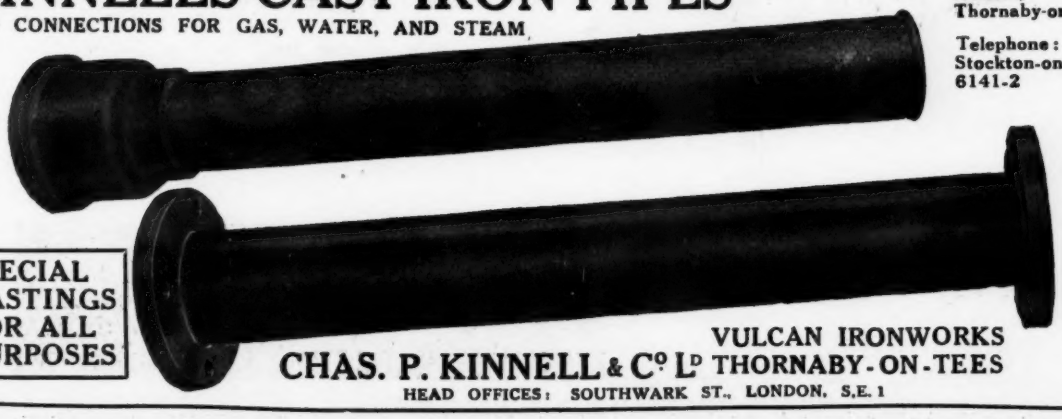

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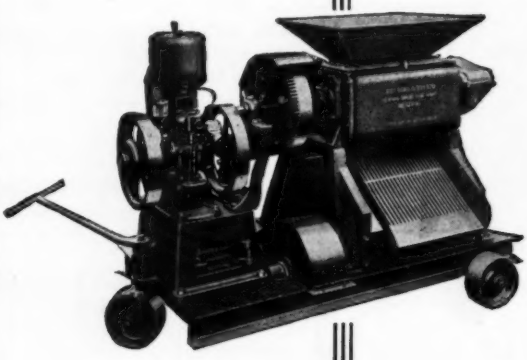
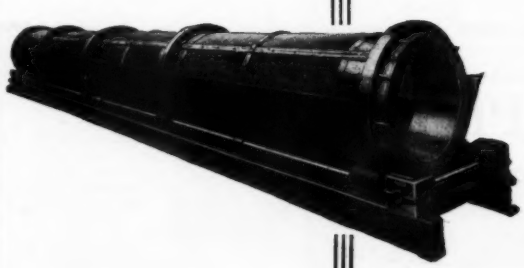


**Cort's Coke Cutting and Grading Plant is the outcome of long experience in supplying the requirements of discriminating Engineers. It is**

## 100 % VALUE,

**not built down to a price, but designed rather to create a standard of quality above competition.**

**Special attention has been given to the countering of the abrasive and corrosive action of coke wherever it is in contact; thus ensuring the maximum of service at the minimum of Cost for upkeep over long uninterrupted periods.**



**We appeal to Engineers considering the installation of Coke Handling Plant to bear in mind the foregoing points—and it may be opportune to quote John Ruskin :—**

***"There is hardly anything in the world that some man cannot make a little worse and sell a little cheaper, and the people who consider price only are this man's lawful prey."***

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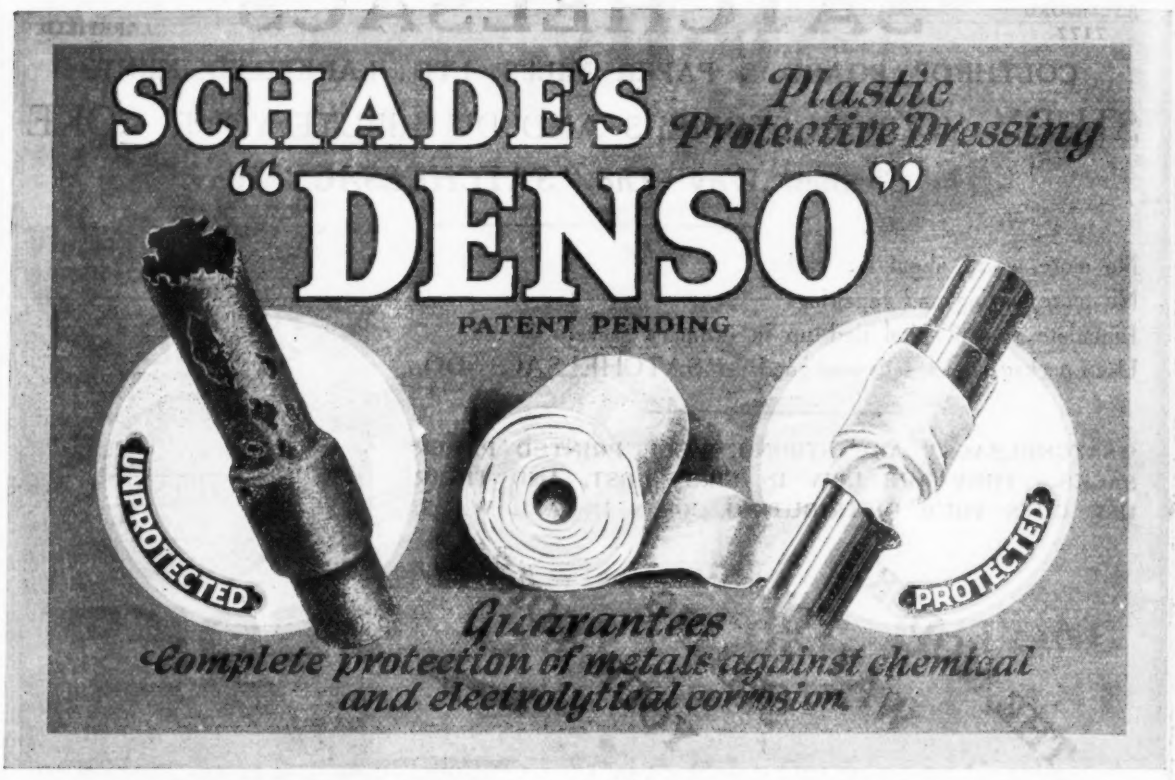


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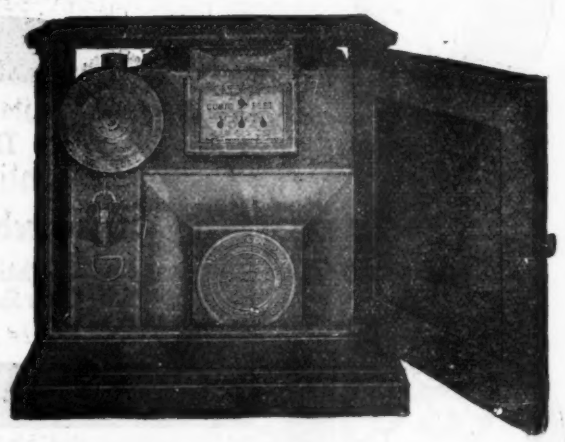

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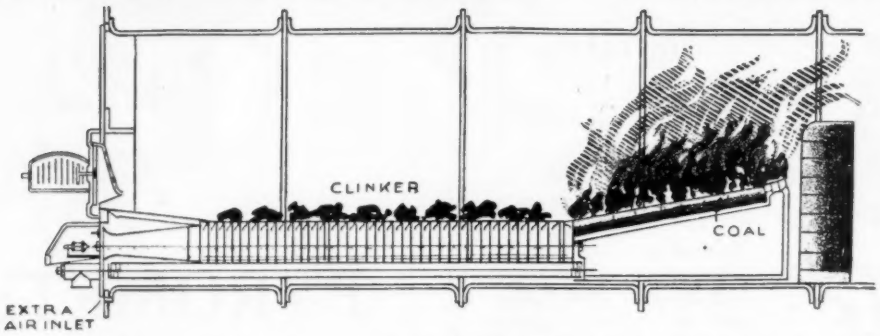


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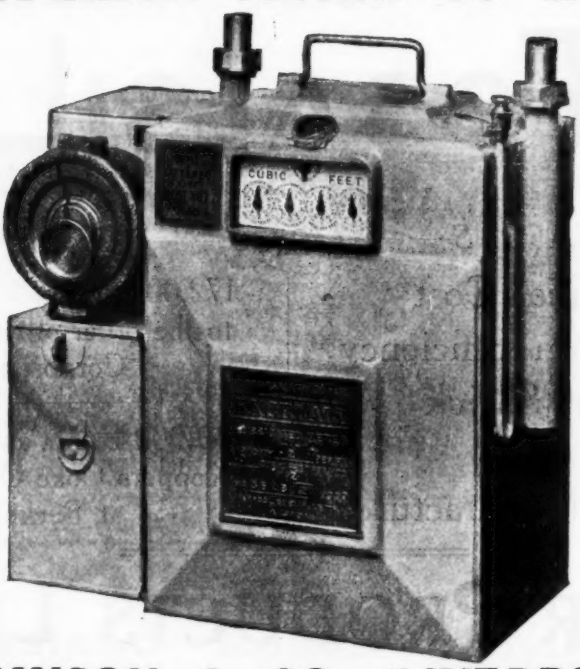


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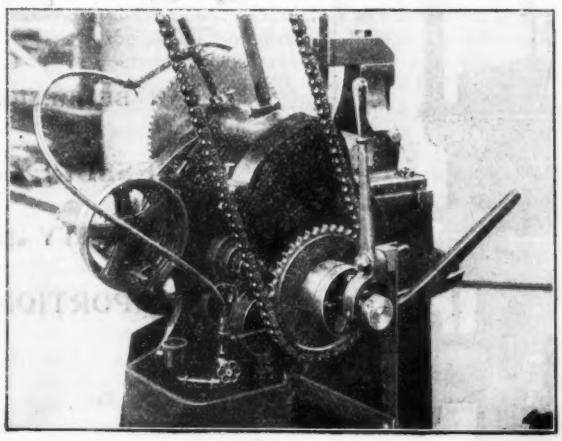

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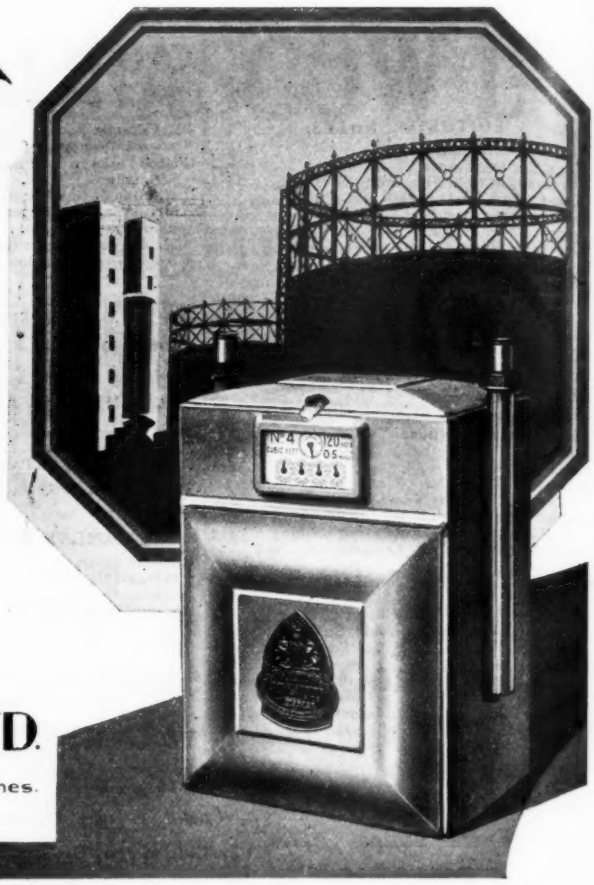

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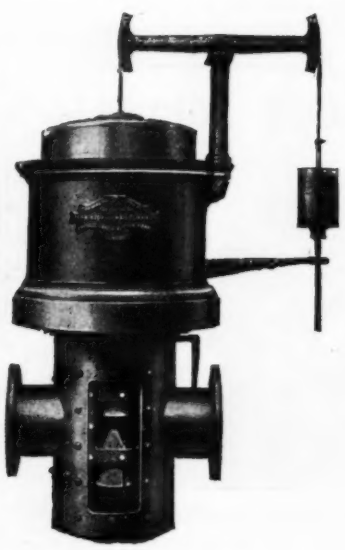

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VOL. CXC. No. 3500.] WEDNESDAY, JUNE 18, 1930. [82ND YEAR.


# Editorial Notes.

## Correspondence Classes.

NECESSARILY, correspondence tuition is a second-best to corporate teaching; it can never be a complete substitute. But to-day it has a very real and important place in educative training, a place which ought not to be—indeed, cannot be—despised. It has transformed the lives of thousands of young men who otherwise would have been debarred from positions for which they were fitted by brain-capacity and by character. We believe that the very fact that a youth is willing to sacrifice his time, and the comfort of himself and others around him, is sufficient indication that he is of the type of which the nation, and every industry in the nation, are in need. Also, it must not be forgotten that this type of tuition has a definite and wholly correct appeal to a certain type of youth—a type all too often ridiculed by his fellows, and, alas, by teachers, not a few of whom are too hasty in their denunciation of "cramming."

A theoretical examination is, to our mind, neither more nor less than a test of mental capacity. It can fulfil no other purpose, albeit the purpose which it does fulfil is a good one. Now it is expressly stated in the Education Scheme of our industry that the mere passing of a theoretical examination is not a criterion that a candidate will be certificated under the Scheme. In our columns a few months ago, Mr. Walter Hole stated that every external candidate qualifying for the Higher Grade Certificate in either Gas Engineering or Gas Supply must present himself for oral examination, in which his proficiency in the ancillary as well as the main subjects will be tested. "The mere 'crammer' who 'swots' to pass the written examination will be fortunate indeed if he manages to negotiate this additional hurdle." Judging from this, there need be no undue fear about the "crammer."

No one of experience, we suggest, would affirm that correspondence tuition offers anything like a complete substitute for class tuition in technical institutes. Also, it is obviously a duty of those in any way responsible for the welfare of the gas industry to encourage young men to attend organized classes wherever this is possible. At present the numbers of students attending classes in gas subjects at technical institutes outside the London area are in many cases so small that the defection of even one or two might mean the closing-down of a class—a step most detrimental. Such defection ought, however, to be avoided by pressure being brought to bear upon the students by their chiefs.

The problem remains with us that very large numbers of keen students are isolated from the advantages of organized class training. For these, the only plan is to apply their energies to learning through the post. And we might well ask ourselves whether we as an industry offer sufficient encouragement to this branch—an essential branch—of gas education. Do we need further facilities? We are sure that this question—raised afresh in a new aspect by Mr. J. E. Blundell, in our last issue—should be ventilated; and our columns, which "educate while they ventilate," offer an admirable medium for our readers to express their opinions on this important matter. An invitation is extended to our readers to make use of the "JOURNAL" in the solution of a problem which, we feel, has a bearing on the future prosperity of our industry.

## Selling Tar to Advantage.

THE British Road Tar Association are doing commendable work to popularize the use of tar on the roads of this country; and through their research on conditions appertaining to Great Britain they are assisting gas undertakings throughout the world to sell their tar to better advantage. They are undoubtedly tackling the problem from the right aspects. Not only have they formulated specifications for the correct types of tar to be employed, but they have gone deeply into the question of how best to apply the approved material—a material which, in the interests of the nation, ought to be used more extensively for road construction and road surfacing. The application phase of the problem is not one whit less important than the production phase. All the expenditure of effort in producing a satisfactory tar must be wasted if the resultant product is casually applied to the roads.

In our columns to-day is an extract from a paper which was presented at a meeting of the Northern Irish District of the Institution of Municipal and County Engineers, at Belfast, last Friday, by Mr. W. E. Cone, who is Technical Adviser to the British Road Tar Association. The extract is an admirable indication of the services which the Association are rendering to our industry; and the practice of continuously putting forward this information to municipal engineers and surveyors is of the greatest value. Mr. Cone points out that the real measure of efficiency in road construction is not the finest thoroughfare that can be fashioned regardless of expense, but the most effective road that can be built for a certain definite expenditure. There are several essential qualities which a road should possess. It should be durable, noiseless, easily maintained, non-slippery for all classes of vehicle, and economical in construction and upkeep. Properly prepared gas-works tar fulfils all these requirements, provided that the tar is correctly applied. Much improvement has already attended the efforts of the British Road Tar Association; but there is much solid work yet to be done. It is surprising—considering that the practice of surface dressing with tar has been established for so many years—to note the haphazard manner in which this surface tar-

ring is too often carried out. And in regard to the construction of tarmacadam roads, the author emphasizes that consideration should always be given to the chemical and physical properties of the stone, since the surface textures of road stone are widely different. Mr. Cone explains that stone which is hard and tough demands a tar of higher consistency than does stone which is not hard or tough. On the subject of surface treatment, he mentions the advisability of employing a tar of somewhat higher viscosity than that comprising the binder in the undercoat; and care should be taken to avoid an excess of tar.

Very interesting are Mr. Cone's remarks on the investigations which the Association are carrying out on the question of tar-surfacing concrete roads. The treatment is now formulated; it consists in applying a prime coat of liquid creosote to the clean dry surface of the concrete, and, after an interval of twenty-four hours, following with a coat of No. 1 tar. Very interesting, also, is the author's reference to the hot-mix process, which is making rapid strides and "holds out great possibilities for the construction of roads capable of carrying heavy traffic." The salient features of the process are the use of a much higher consistency of tar, graded mineral aggregate, high temperature mixing, and the laying of the material when hot. Under these conditions traffic can be turned on to the road immediately on completion of rolling. There is no doubt that the most successful results with tar will be realized only when every consideration to the materials employed is given by those responsible for road building and maintenance; and the British Road Tar Association have now a wealth of information on this subject. We hope that municipal engineers and surveyors will draw upon it; as they do so, the reputation of tar will be enhanced in more than direct proportion.

# Coke Ovens at Collieries and Steel Works.

LAST week, in our review of Mr. E. G. Stewart's comprehensive contribution to the proceedings at the Leeds meeting of the Institution of Gas Engineers, on the subject of coke ovens in relation to town gas supply, we purposely confined our remarks to that section of his paper dealing with the desirability of erecting coke oven plants as a gas-producing unit at gas-works. Though the discussion on the paper centred on this aspect of the matter, there are two highly interesting sections of the paper which deal with the functions of the coke oven first as a coke-producing unit *per se*, and, secondly, as an adjunct to steel works. On both these phases, Mr. Stewart had a great deal of important information to impart. We have from time to time expressed the view that, generally speaking, the best place for the coke oven is adjacent to steel works; and Mr. Stewart demonstrates by his careful analysis that our views on this matter are not so very wide of the mark.

In America the steel industry has for many years been in the hands of undertakings controlling ore, coke, iron, steel, and transport, under one management. The improved gaseous yield from the modern coke oven has enabled such undertakings to make the maximum use of the effects of the thermal interlocking of the ovens, furnaces, and steel works, and has resulted in the formation of combined works of considerable magnitude. This thermal interlocking has had the active approval and support of eminent technologists for many years; but it is generally agreed that success is not possible with combined works producing less than 2500 tons of steel per day, and is not completely achieved until a capacity of 5000 tons per day is reached. The extent to which America has approached the ideal, however, says Mr. Stewart, is shown by the fact that 97 p.ct. of the coke produced, and 65 p.ct. of the surplus gas yield of ovens connected with the iron and steel industry are used internally. In Germany a similar state of affairs is prevalent. In England, however, the coke ovens are mainly connected with collieries; there are only a very few combined ovens, iron works, and steel works. Moreover, the average output of steel works installations is only some 500 tons per day. At present, Mr. Stewart observes, the most pressing problems would seem to be the location of the new ovens which must be erected soon, the ownership of such ovens, and the making available to steel works of the additional gas that will then be produced if they should not be erected in conjunction with them.

During the last few years the coke oven has undergone many modifications, and throughout this period those who have been responsible for its working have undertaken a great deal of research work into the production of different types of coke from different classes of coal. Not the least important among these researches has been the effect of blending. The coke oven may exist simply and solely as a coal-processing unit; and the influence of such operation on the gas industry cannot be disregarded. It can utilize inferior coals—inferior, at any rate, from the gas making point of view—and it can offer severe competition to the solid smokeless fuel at present produced by gas undertakings in its locality. Sight should not be lost of this aspect of the functions of the coke oven.

### A Good Word for Gas.

We were glad to see in the "Sunday Express" for June 15 that the City Editor, Mr. S. W. Alexander, pointed out to his readers the need for new legislation for the gas industry. Present legislation, he emphasized, prevents our industry from moving with the times. He presented the case for gas clearly and without prejudice.

### Boycott of Gas and Electricity.

The Frankfurt Correspondent to "The Times" stated yesterday that the inhabitants of Langenberg have proclaimed a boycott against the use of gas, water, and electricity supplied by the city, which has effected a sharp rise in the respective rates for the purpose of increasing its revenues. In spite of the great heat during the last few days, a large number of people have started cooking meals on coal fires, and have resorted to the use of candles for lighting purposes.

### Novel Seal Support for Waterless Holders.

Our readers will be interested in Mr. J. W. Scott's description of a new seal support for waterless holders. Mr. Frank Prentice mentioned this during the Institution meeting at Leeds; and we are now able to illustrate the device. The supporting medium can be of soft Swedish iron or other material of a flexible character, secured to the back of the slipper plate, but with a free outer edge resting upon the outer rim of the piston. The sailcloth retains the tar seal in precisely the same way as heretofore.

### Rationalization.

Mr. George Evetts, whose suggestive articles on the subject of rationalization in the gas industry are now appearing in the "JOURNAL," gave evidence at the inquiry by the Board of Trade, reported at length in our present issue, regarding an application by the Watford and St. Albans Gas Company for an Order authorizing the amalgamation with that Company of the Elstree and Boreham Wood Gas Company, Ltd. Mr. Evetts is Consulting Engineer to the Watford Company, and the scheme outlined at the inquiry may be studied in conjunction with his articles in the "JOURNAL."

### Co-operation between School and Workshop.

At the conference of the Association for Education in Industry and Commerce, which was opened in Liverpool on Friday last, Lord Leverhulme, the new President, expressed the opinion that a manager's report upon a student in his work hours was just as valuable to the principal of a technical institution as the principal's report upon the student in his school hours was important to the manager. In what manner, he asked, could a business best recruit the type of man who could be looked upon to fill in later years the higher administrative positions? This was an era of rationalization, mergers, and big corporations, and examples of a small independent family business were becoming fewer. The larger the corporation, the less it became possible for every detailed problem to be submitted to the decision of the central headquarters, and the greater was the necessity of having men capable of accepting responsibility

and displaying initiative. Could education be moulded so as to supply this need? Faculties or Departments of Commerce had been established in several of the modern universities. No one could question the value, interest, and usefulness of the courses of study which they provided, but it had yet to be shown, he suggested, that they necessarily turned out more useful men for industry and commerce than other courses of study.

### An Ideal System.

"We believe," said Lord Leverhulme, "that if the nation is going to spend vast sums, which it can ill afford, on further education, the education given should bear some relation to the work the pupil is going to do in later life. I see a real danger that this great question may get entirely into the hands of vague enthusiasts, who cry out for more and more education with a big E, and who are perfectly happy so long as they see more and more schools going up, with more and more teachers needed to fill them, and more and more young people turned out in the world with an array of half understood accomplishments, highly estimable, no doubt, but which it is entirely unnecessary to impart at the public expense. We believe that the ideal system, so far as industry is concerned, is that there should not be a sudden break between school and workshop or office, but that for a period the two should run concurrently."

### June 16 to 25.

This is the period of the Second Plenary Meeting of the World Power Conference in Berlin. There was a brilliant preliminary in the Reichstag last Sunday evening, when President Hindenburg held a reception. The conference proper—the greatest representative international meeting of power personalities ever staged—commenced in the auditorium of the Kroll Opera House on Monday morning; and in the afternoon the limelight was directed on "The Production and Preparation of Solid Fuels." Yesterday, "Heat, Fuel, and Power Economics in Individual Countries," "Research Work," "Standardization Problems and the Rationalization of Statistics," and "Education" were among the subjects discussed; while to-day attention will be devoted largely to "Gas Markets" and "Economic Problems of High-Temperature Distillation." To all these sections authors whose names are well known to our readers—for example, Sir Francis Goodenough, R. Lessing, E. C. Evans, Michael Barash, Stephen Lacey, James Wood and Gilbert Howarth, Allan Monkhouse, C. H. Lander, Harold Hollings, T. P. Ridley—are making their contributions; and we can say already that the Berlin conference will benefit the cause of gas throughout the world. Regarding the meeting more generally, we may mention that the papers themselves number more than four hundred, and represent contributions from each of the forty-eight countries who are members of the conference. Great Britain alone has contributed about fifty papers, sponsored by the leading technical organizations and associations of this country. At the conclusion of the conference, facilities are granted for inspecting the most important power and industrial plants in Germany, the number of such plants which can be visited in this connection being over two hundred. They include gas-works, coking installations, and long-distance gas supply plants.

### The Waverley Association.

As announced last week, the Annual Meeting of the Waverley Association of Gas Managers takes place in Edinburgh on June 27, under the Presidency of Mr. David Vass, of Perth. The Waverley claim to be the oldest of our Gas Associations, for it is seventy years since their inauguration. In view of this, it has been interesting to look back through our old volumes; and in the "JOURNAL" for April 13, 1897, we find our Scottish Correspondent writing, "it seems to be established, beyond doubt, that the Waverley is the 'granny' of the Associations." Giving a report of the 72nd informal meeting, our Correspondent proceeds: "By the favour of the Secretary of the Waverley Association (Mr. J. D. Smith, of Selkirk), I am able to reproduce a document which clears up the darkness in which the origin of the Waverley Association is enshrouded. It also enables me at the same time to do fuller justice to the memory of the late Mr. W. Robson (Mr. Smith's predecessor at Selkirk) than I was able to do in the 'JOURNAL' for the 30th ult."

### An Interesting Document.

"The document is embodied in the minute-book of the Association, and is entitled: 'Statement prepared by Mr. Robson with reference to the formation of the Waverley Association.' It is dated April 25, 1892. I give it in full: 'Gas-Works, Selkirk. Statement of Mr. W. Robson, Gas Manager, Selkirk, as to the origin of the Waverley Association of Gas Managers. The Waverley Association was commenced at Kelso, Aug. 5, 1861. During the month of July previous to that, I wrote to all the gas managers nearly, south of the Forth, to meet at Kelso on the 5th of August; and we put Mr. Clazy, Kelso, in the chair. Mr. Adamson, then in Galashiels, now in the Airdrie Iron Works, we made Secretary; and he took minutes of all that was done. One of the resolutions was to advertise in the papers to all gas managers in Scotland to meet in Edinburgh in the month of April, 1862, to form one general Association for Scotland. Mr. Adamson, having been Manager at the Leven Gas-Works before he got to Galashiels, was intimate with Mr. W. Mackenzie at Dunfermline, then Manager at Cupar. They had been corresponding; and Mr. Adamson had written to Mr. Mackenzie what had been done at Kelso. Through this, Mackenzie had apparently warned some of the Fife and Clackmannan managers; and they had met at Leven on Jan. 24, 1862, and formed an Association, called the Fife, Kinross, Perth, and Forfar Association of Gas Managers. In the month of April we met in Edinburgh, and formed the Scottish Association of Gas Managers. I remember both Mackenzie, of Cupar, and Lowden, of Leven, attended. A resolution was proposed that the annual fee to be paid was to be 2s. 6d. Mackenzie proposed 2s.; and Lowden seconded him. The 2s. 6d. was carried; those two only voting for 2s. So those two Fife gentlemen did not join the Association, or ever come back again. In a pamphlet sent out by the North British Association, you will see that they had Lowden down as first Chairman of that Association. He might be the first Chairman of the Fife, &c., Association, but never of the Scottish Association. Mr. Clazy was put in as first President; and Mr. Adamson as Secretary. The Scottish Association swallowed up the Fife, &c., Association, and then became the North British Association. The minute-book of the Scottish Association will show all I have written. The Waverley Association has always continued since the Kelso meeting.' This is a clear statement," concludes our correspondent, "and is worth having on record. I understand that the minute-book of the first meeting at Kelso cannot be produced, as it was lost by Mr. Adamson about the time of the meeting in Edinburgh in April, 1862."

## Forthcoming Engagements.

**June 21.**—LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.—Summer visit to Eastbourne.

**June 21.**—WESTERN JUNIOR GAS ASSOCIATION.—Summer outing. Visit to the works of the Plymouth and Stonehouse Gas Light and Coke Company.

**June 26.**—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS (EASTERN DISTRICT).—Meeting at 28, Grosvenor Gardens, Westminster, S.W. 1, at 2.30.

**June 27.**—SOCIETY OF BRITISH GAS INDUSTRIES.—Council meeting in the morning.

**June 27.**—WAVERLEY ASSOCIATION OF GAS MANAGERS.—Annual meeting in the Goold Hall, St. Andrew's Square, Edinburgh. Address by the President, Mr. David Vass.

**June 28.**—MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION.—Ladies' Day. Visit to Wallasey Gas and Water Works in the afternoon.

**July 8.**—NATIONAL GAS COUNCIL.—Meeting of Central Executive Board, 28, Grosvenor Gardens, S.W. 1, 2.30 p.m.

**July 11.**—MANCHESTER DISTRICT INSTITUTION OF GAS ENGINEERS.—Visit to Bolton Gas-Works and Lecture on "The Microscopical Examination of Coal in Relation to the Production of Gas and Coke," by Mr. James Lomax, A.L.S., F.G.S., M.I.M.E., Paleo-Botanist to the Fuel Research Board. The lecture will be illustrated by lantern slides and microscopical preparations.

**Aug. 19 and 20.**—IRISH ASSOCIATION OF GAS MANAGERS.—Meeting in Dublin.

**Sept. 11.**—NORTH BRITISH ASSOCIATION OF GAS MANAGERS.—Annual Meeting at Aberdeen.

**Oct. 27 to 29.**—BRITISH COMMERCIAL GAS ASSOCIATION.—Annual Meeting at Hull and Bridlington.

XUM

## Personal.

Mr. H. Foss, who has been Manager of the Thirsk Gas-Works Undertaking for 44 years, is to retire on Aug. 21. Mr. ROBERT HARLE, of Silloth-on-Solway, Cumberland, has been appointed his successor, but the services of Mr. Foss as Consultant will be retained.

Connected with the firm of Messrs. John Harper & Co., Ltd., Albion Works, Willenhall, Wolverhampton, for nearly 50 years, Mr. CHARLES RETALLACK has just retired from the position of Managing Director of the firm. He has been the recipient of several presentations from different branches of the firm for whom he has worked so long.

News has reached us that Mr. LESLIE BEAUMONT, whose serious illness we announced a short while ago, is now convalescent, and left the nursing home, where he underwent a trying, though successful, operation, last Monday. Messrs. W. G. Beaumont & Son, of Priory Works, Bow, E. 3, desire to thank all friends for their kind inquiries.

## Obituary.

The death is announced, at the age of 79, of Mr. T. J. PAGE, whose remarkably long service of 58 years with the Tottenham and District Gas Company is recalled. Mr. Page started as a boy with the Company and rose to be Gas Inspector. He was transferred to Wood Green about forty years ago. When he retired under the age limit in 1924, he was presented with a certificate and a gold watch by Mr. H. Woodall on behalf of the Directors; and Mr. H. C. Smith, the Chief Engineer of the Company, presented him, on behalf of the office and distributing staffs with a handsome chiming clock. His son, Mr. T. V. Page, is now Inspector at the Ponders End Depôt of the Tottenham Company.

The death occurred, on June 11, of Mr. GEORGE A. SUGG, at the age of 50. Mr. Sugg received his early training under the late Mr. William Sugg, and was connected with the firm of William Sugg & Co., Ltd., during the whole of his business career.

# Glimpses into the Past.

## From the "JOURNAL" Eighty Years Ago.

### Gas Engineer for Mauritius?

"L. M." sends us a copy of the "Ceneen," a paper published in the Mauritius, from which it appears that our "JOURNAL" has reached that tropical island, and awakened a desire for the introduction of gas—an excellent opening for an unemployed gas engineer.

### Goddard's Asbestos Gas Fire.

We had an opportunity a few days since of inspecting this very elegant application of gas to the production of a cheerful fire in an open grate. It is simple, portable, and economical, both in first cost and in its consumption of gas—seven feet per hour being sufficient for the warming of a moderate-sized compartment.

### New Gas Cooking Stove.

Mr. Bower, St. Neots, Hunts., has lately registered a gas cooking stove which has two cases of thin metal with a non-conducting medium between. The size we now describe is called No. 3, costing £6 10s., and is 2 ft. 6 in. wide, 2 ft. 10 in. high, and 2 ft. deep. It has two compartments, at the bottom of which are two iron pipes into which are screwed a number of nipples having minute perforations and arranged at certain distances (depending upon the size of the stove). These, when lighted, give a very thin jet of gas, with only a feeble blue light, but considerable heat. In the one compartment a couple of fowls may be roasted; and in the other a very large piece of beef and eight or ten pies. The top has projecting studs, much higher than those in general use, and it is so arranged that five large saucepans or boilers may be placed on it at once. The inventor states that the consumption of gas averages only 35 c.ft. a day.

### A Treat for the Civic Aristocracy.

Mansion House Street promises to be a flourishing rival to Charing Cross, in the occupation it affords to the competing gas companies in research after leaks. For years past one could seldom pass the latter locality in daylight at any season of the year without observing half-a-dozen men at work picking up the paving stones and sniffing each shovelful of earth, for some trace of the erratic truant. The enormous traffic concentrated in front of the Mansion House has similarly afflicted the mains of the three city gas companies, and permitted some of their odoriferous contents to penetrate the apartments of his civic majesty's palace. Nearly every line of gas pipes passing through Mansion House Street has, consequently undergone a critical examination during the past month, and a few trifling leaks have been discovered; but the nuisance remains unabated; and it would, therefore, appear that the mischief had its origin at some distance from the point where it declares itself.

### From a Report of the Marylebone Gas Consumers' Protection Committee.

Shortly after two o'clock, at which time but very few persons had assembled, Mr. William Pearse, the well-known champion of the old gas companies, made his appearance, and took his seat quietly by the side of a table on the platform. The moment that he was discovered loud yells were raised that he was no ratepayer, and a demand was made on the police, by a person whose name was stated to be Nice, to remove him, but which, upon the protest against such a proceeding on the part of some respectable ratepayers, the police at this time refused to comply with. The incident, however, caused great confusion.

Mr. BELTON said that they had already taken a preliminary step, in the formation of an association, to put down the shameful coalition and monopoly which had existed among the gas companies in Marylebone for the last 25 years. It was between the Chartered and Equitable, and Imperial; and he had been, with the other parties in that parish, trying to break it up for the last 20 years. He now found there was a better feeling. ["No, no," Laughter, and "Hear."] He said they had a better feeling now existing in the representative body of that parish. [Cries of "Oh, oh."] Had not the present vestry allowed other companies to lay down their pipes without restrictions? ["Hear, hear."] The coalition and the monopoly would not have existed so long as it had done if that party who had held the power for so many years, but who had now been sent to the right-about, had done their duty. ["Hear, hear," and "Oh."] Would the old party have let the Equitable or the Western in without any restriction? ["No."] No; they made it a *sine qua non* that, if they were permitted to lay down a pipe, they should give a bond of £20,000 to lay them all over the parish, or they would not let them come in at all. ["Hear," and cries of "Very proper."] He understood that the Western Company was permitted last Saturday to come in and lay down their pipes in Oxford Street. Was this the case three years ago? ["Hear," and "No."] But what had the vestry done? They allowed the Western Company to come in and compete with the Equitable and the Chartered; but why did they not let them compete with that Company which had been robbing us for so many years. [Tremendous uproar, cries of "Apologize," "Shame," "Hear," &c., &c.] The gas supplied to Marylebone was the worst gas in London. [Cries of "False, false," "No, no," and confusion.] Instead of being gas of coal, it was mere watery vapour. [Laughter, cries of "Shut up," and "Hear, hear."] . . .

Mr. SHIELD: Ridiculous. [Groans and uproar.]

**Safety in Mines Research Board.**—In the course of investigations into the deterioration of colliery winding ropes in service, made under the Wire Ropes Research Committee of the Safety in Mines Research Board, it has been found that the wires in ropes made to the same specification have had different microstructures and have given widely different results in service under apparently similar conditions. Work has therefore been in progress with the object of establishing a definite relation between the microstructure of a wire and its mechanical properties and so determining which microstructures are likely to give the best results in service. Wire making involves four principal operations: (1) Making the steel; (2) rolling the steel into rod; (3) heat treatment; and (4) cold drawing the rod into wire. The heat treatment has a very important bearing on the properties of the material from which the wire is drawn, and a paper by J. M. Robertson, just published as Safety in Mines Research Board Paper No. 50, deals with the first stage of experimental work regarding this heat treatment before drawing. The wire ropes research is carried out at the City and Guilds (Engineering) College under Prof. S. M. Dixon, M.Sc., and the metallurgical work, which forms the subject of the paper, has been performed at the Royal School of Mines under the supervision of Prof. Sir Harold Carpenter, F.R.S. Copies are obtainable from H.M. Stationery Office, price 2s. net.

# In To-Day's "Journal."

**Corporation Undertakings' Results.**

The results of the year's work of several Corporation Departments are given this week. Steady progress and a healthy financial position seem to be indicated in the majority of cases.

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**Josiah Wedgwood Bi-centenary Celebration.**

Much of the time of the Ceramic Society, on the occasion of their Josiah Wedgwood Bi-centenary Celebration, was necessarily taken up with various ceremonial and other special proceedings. Some brief notes are given, however, on sections of the contents of the Wedgwood Bi-centenary Commemoration Volume, which should be of considerable interest to those concerned with refractory materials.

* * * *

**Gaseous Fuel in New South Wales.**

On later pages to-day are extracts from the Presidential Address of Mr. R. J. Bennie before the Victorian Institute of Engineers, in which he deals with the manufacture and utilization of gaseous fuel in New South Wales. He refers to blast furnace gas and coke oven gas, and to the scientific treatment of brown coal, which, he says, has infinite possibilities for gas making, and for the extraction of valuable oils and chemicals. Finally, he touches upon the point of bulk transmission of gas in connection with the erection of gas-works at the pit head.

* * * *

**British Tar for British Roads.**

At a meeting of the Northern Irish District of the Institution of Municipal and County Engineers, held in Belfast on June 12, Mr. W. E. Cone, Technical Advisor to the British Road Tar Association, presented a paper—extracts from which we give to-day—on the subject of coal tar in connection, particularly, with its use for road purposes. Mr. Cone discusses the question of foundations for macadam roads, and gives details of methods of dressing for different types of surfaces. He also describes a method of tar dressing a concrete road.

* * * *

**Waterless Holders.**

In a written communication to the discussion on Mr. Prentice's paper before the Institution, on the subject of the waterless gasholder, Mr. J. W. Scott (of Messrs. R. & J. Dempster, Ltd.) tells something of his own experience of this type of holder. It is no simple matter, says Mr. Scott, to lubricate the outer rim or contact seal of a waterless gasholder, for at Ipswich its length will be about 400 linear ft.; so what finer medium would you require for this purpose than suitably prepared tar? "When we consider the advantages the writer of the paper attributes to his dry storage," continued Mr. Scott, "when a considerable proportion of his gas is still stored over water-filled tanks, greater benefits would accrue if the entire storage comprised gasholders of the waterless type."

* * * *

**Ideal Homes Exhibition at Bournemouth.**

The Bournemouth Gas and Water Company arranged an attractive display at the Ideal Homes Exhibition held in Bournemouth from May 8 to 17. Some photographs to-day give a good idea of the Company's attractive exhibits.

* * * *

**Rochester, Chatham, and Gillingham Gas Order.**

A Special Order has been promoted, under the Gas Undertakings Acts of 1920 and 1929, by the Rochester, Chatham, and Gillingham Gas Company, who seek to include within their limits of supply a fairly large area comprising a number of parishes in the rural districts of Hoo, Milton, and Strood, in the County of Kent. This was the subject of an inquiry by Mr. J. F. Ronca (Director of Gas Administration) at the Offices of the Board of Trade at Westminster on Friday, June 13.

* * * *

**How Electricity is "Sold" at Hastings.**

Mr. Chas. F. Botley, Engineer and General Manager to the Hastings and St. Leonards Gas Company, has prepared a very interesting graph and accompanying explanation of how electricity is "sold" at Hastings. It is pointed out that although nearly 35 p.ct. of the output of electricity at Hastings was sold under the average works cost, and a further 37 p.ct. at under the average total costs, there was on the year a net profit of £24,092, suggesting that other items, such as rental of meters and apparatus, miscellaneous receipts, showrooms, Government grants, and the like, may have contributed towards these results.

* * * *

**Annual Report of the Blackburn Undertaking.**

The annual report of Mr. G. P. Mitchell, Manager of the Blackburn Corporation Gas Department, shows that the quantity of gas made during the year ended March 31 last was 1,126,577,000 c.ft.—a decrease of 1·38 p.ct. Despite trade depression, however, the report states that the sales of appliances and fittings effected through the showrooms exceeded all expectations. After meeting necessary charges there remained a net profit of £5695 for appropriation.

# Correspondence.

*[We are not responsible for opinions expressed by Correspondents.]*

## "Coalite" Redivivus.

SIR,—Mr. Still's letter mostly provides its own answer, and confirms my belief that his "Coalite" effusion came from a "financial" source.

Though I am not unfamiliar with the publication "Who's Who," it does not appeal to me as a good authority on "Who's Who" in coal treatment. So far as this controversy is concerned, the chances are that anyone who has had no practical and administrative training in that sphere is likely to prove a delusive mentor on its capabilities. Mr. Still's entertaining account of how he was drawn to "write up" "Coalite" is reminiscent of the candidate for a commercial post who, on being asked "Can you speak German?" replied "No; but I have a cousin who can play a German concertina."

As Editor of "The Investor's Review," though writing as a "layman for laymen," Mr. Still must know that what he says in his columns will be read by people with money to invest, and therefore that his statements should be able to stand up to any criticism. Will his friend Prof. H. G. Reid, so ingenuously brought into his defence, countersign all that he said on "Coalite," and agree that his laudation of it is warranted by the very superficial means whereby Mr. Still arrived at his "convictions?"

In regard to the "proposition" put to me as to the circumstances attending the Works Manager's presentation of weekly returns, I retort in Mr. Still's own words, I am "too old a controversialist" to be drawn into making any statement upon which Mr. Still can hang a grievance as being outside the bounds of fair criticism. This cross-examination cannot be diverted either to the Works Manager or to those who instructed him; it is Mr. Still's "evidence" that is before the "Court," and, in legal parlance, he does not prove to be a very good "witness."

Let me put one or two "propositions" to Mr. Still. (1) Can he produce a balance-sheet, duly audited, from any source, which will show "Coalite" as a sound commercial proposition over a full year's working? (2) Should not a "guide" on finance and investment, before lauding any venture, wait until unbiased experts in that particular sphere have certified it as a sound financial proposition? (3) Can he explain why certain "Coalite" shares, offered for sale through brokers a few months ago at 3s. 6d. each, brought an offer to *purchase* about a fortnight ago at 1s. per share each? That is not the kind of sequel that he would expect to his own "convictions" as to its immense possibilities. (4) Did the Manchester publicists (Dean, Lord Bishop, &c.) authorize the publication of their letter to Low Temperature Carbonisation in his laudatory article? (5) Was the permission of the South Metropolitan Gas Company obtained to publication of the prospective results from the East Greenwich plant, which, if I am not mistaken, is not yet at the producing stage?

By all means let Mr. Still continue "consistently to oppose the wasteful and unnecessary exploitation of electric light . . . at the expense of the gas industry," for here, at least, he has an unanswerable case—which is more than can be said for his venture into the realm of coal carbonization.

J. H. BREARLEY.

*Wharmton, Harrogate,*
*June 16, 1930.*

# Commercial and Industrial.

## Stock Market Report.

**[For Stock and Share List, see later page.]**

When the Stock Exchange re-opened after the Whitsuntide holiday there was little, if any, indication of a change for the better, and most sections continued dull. The Industrial Market, with the exception of a few specialities, was distinctly depressed, and we cannot foresee any appreciable improvement in this section until some of the present high taxation costs are reduced.

Gas stocks and shares remained calm and had another uneventful week. The only changes in the quotations were: Bristol ordinary with a rise of 1 on the local Exchange to 89½; Cape Town £10 shares hardened ½ to 9½; Northampton 5 p.c. maximum gained 1 to 76½; and South Metropolitan 6 p.ct. preference 1 to 109½. Imperial Continental eased 5 points to 360.

To those requiring an immediate "safety first" investment, we would recommend the ordinary stocks of the Gas Light and South Metropolitan Companies. There is usually stock available, and prices at the present time are on the low side. On the basis of last year's dividends the yields are as follows:

| — | Present Price. | Dividend. 1929. | Yield P.Ct. per Annum. |
|---|---|---|---|
| | | | £ s. d. |
| Gas Light £1 units . . . . . | 19s. | £5 12s. | 5 17 10 |
| South Metropolitan . . . . . | 103 | 6¼ | 6 1 4 |

Attention is also drawn to the ordinary stock of the Uxbridge Company. This stock was marked down *ex* div. in March last from 99½ to 96½, at which price it still stands, and the yield, therefore, on the 1929 dividend (7 p.ct.), is £7 5s. The stock, however, is not always readily obtainable.

The Directors of the Malta and Mediterranean Gas Company, Ltd., are recommending a final dividend of 5 p.ct. (free of tax) on the ordinary capital, making 10 p.ct. for the year to March, against 9 p.ct. the previous year. The carry-forward is increased from £19,925 to £20,119.

## Coal Markets.

There is little to say about the markets, and, without exception, the outlook remains bad both in this country and for Continental producers. An example of the present state of competition is the placing of the whole of the Swedish railways contract with Poland—a 200,000-ton order from which Northumberland and Durham benefited largely on the last occasion. This time the price at which it has been taken is equivalent to 1s. 6d. a ton less than the low current Northumberland f.o.b. prices, and 2s. 6d. to 3s. below Durham. This is, of course, for steams, but gas and coking coals are equally affected, and collieries are lying idle rather than reduce quotations any further. There is not enough business to go round at any price.

Wear special gas coals are quoted at about 16s. f.o.b., and best Durhams at 15s. 6d. Seconds are plentiful round 13s., at which price quite good coking brands are also obtainable. The official export price for Yorkshire screened gas is 15s. 6d. to 16s. 6d. f.o.b.

Gas coke supplies are not excessive, and, with a very fair demand persisting, prices remain steady round 21s. 6d.

## Current Sales of Gas Products.

### The London Market for Tar, Tar Products, and Sulphate.

LONDON, *June* 16.

The market for tar products continues uneventful, and values generally are unchanged.

Pitch is quiet, and the price is steady at 47s. 6d. per ton f.o.b.

Creosote for export is steady at 6d. to 6¼d. per gallon f.o.b.

Solvent naphtha 95/160 is about 1s. 6d. per gallon; pure toluole, 2s. 2d. to 2s. 3d. per gallon; pure benzole, 1s. 10d. to 1s. 11d. per gallon; and pyridine bases, about 3s. 9d. per gallon.

### Tar Products in the Provinces.

*June* 16.

The average prices of gas-works products during the week were: Gas-works tar, 20s. to 25s. Pitch—East Coast, 46s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 46s. f.o.b.* Toluole, naked, North, 1s. 7¼d. to 1s. 8¼d. Coal-tar crude naphtha, in bulk, North, 9d. to 10d. Solvent naphtha, naked, North, 1s. 3d. to 1s. 3½d. Heavy naphtha, North, 1s. to 1s. 0½d. Creosote, in bulk, North, liquid and salty, 3½d. to 3¾d.; low gravity, 1½d. to 1½d.; Scotland, 3½d. to 3¾d. Heavy oils, in bulk, North, 5½d. to 6d. Carbolic acid, 60's, 2s. 2d. June, 2s. to 2s. 1d. July/December. Naphthalene, £12 to £14. Salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum, 40 p.ct., purely nominal; "B" quality, unsaleable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port, it will be necessary to deduct the loading costs and the tolls whatever they may be.

### Tar Products in Scotland.

GLASGOW, *June* 14.

While more inquiries are circulating there is no noticeable increase in the number of orders received. Road authorities continue to utilize tar in substantial quantities; but other products are quiet.

Pitch.—The export value remains nominal at 47s. 6d. to 50s. per ton f.o.b. Glasgow. Home price is easy at 47s. 6d. per ton free on rails.

Tar.—The throughput is well maintained, and quotations remain steady at 3¼d. to 3¾d. per gallon f.o.r. in buyers' packages.

Creosote is quiet, with prices easy. B.E.S.A. specification is 3½d. to 4d. per gallon; low gravity, 3d. to 3½d. per gallon; neutral oil, 3d. to 3½d. per gallon—all free on rails.

Cresylic remains very quiet, and quotations are rather weak. Pale 97/99 p.ct. is 1s. 8¾d. to 1s. 9¾d. per gallon; dark 97/99 p.ct. is 1s. 7¼d. to 1s. 8¼d. per gallon; pale 99/100 p.ct. is 1s. 11¼d. to 2s. 0¼d. per gallon—all in bulk at makers' works.

Crude naphtha is unchanged at about 4¼d. to 4¾d. per gallon.

Solvent naphtha is steady at 1s. 2¼d. to 1s. 3½d. per gallon for 90/160 grade, and 1s. to 1s. 1d. per gallon for 90/190 grade.

Motor Benzole.—The market is steady at 1s. 6¼d. to 1s. 6¾d. per gallon *ex* works in bulk.

Pyridines remain inactive; 90/160 grade is nominal at 3s. to 3s. 3d. per gallon.

### Benzole Prices.

The following are considered to be the market prices at the present time:

| | s. d. | s. d. | |
|---|---|---|---|
| Crude benzole . . . | 0 10 to | 0 11 | per gallon at works |
| Motor ,, . . . | 1 5½ ,, | 1 6¾ ,, | ,, ,, |
| Pure ,, . . . | 1 10 ,, | 1 11 ,, | ,, ,, |

## Trade Notes.

**Tilley Bros., Ltd.**

This firm are moving their Head Offices to Brent Works, Brent Street, Hendon, N.W. 4, on Monday next.

**New Purifiers for Bath.**

The Bath Gas Company have recently ordered from Messrs. W. J. Jenkins & Co., Ltd., of Beehive Works, Retford, a set of four purifier boxes 40 ft. by 30 ft. by 6 ft. deep, together with one catch box 40 ft. by 25 ft. by 6 ft. deep, to be duplicated by a similar five boxes as soon as the first section is completed.

**The Lubrication of Gas and Oil Engines.**

Price's Patent Candle Company, Ltd., of London, S.W. 11, have published a pamphlet dealing with the lubrication of gas and oil engines. The more important characteristics of the ideal lubricant are set out, together with the recommended lubricants for gas and oil engines of varying horse power. The firm will be pleased to send copies of this booklet to those interested.

**Hamworthy Junior Air Compressors.**

A folder published recently by the Hamworthy Engineering Company, Ltd., of Poole, Dorset, deals with their small air compressors in sizes of 3 and 6 c.ft. These compressors are in daily use in garages, electric stations, for paint spraying, and for many other purposes, including blowing the skins off dead animals. The portable sets are fitted with large diameter wheels, so that they are very easy to move over rough ground, and the pneumatic types absorb any shocks.

**Refractories.**

A new brochure on the subject of refractories has been published by Messrs. Gibbons (Dudley), Ltd. The firm's latest developments include the erection of a large high-temperature continuous tunnel kiln, being the first of its kind for firing refractories in this country. Inspection of this plant is welcomed. Messrs. Gibbons now manufacture a full range of refractories, including carborundum, corundum, and sillimanite, and by systematic testing and research in their laboratories they are able to ensure sound first-grade products for all purposes.

**The Becker Coke Oven.**

A recently published booklet by the Woodall-Duckham Companies shows, mainly by means of most excellent photographs, the reason why Becker ovens, which were introduced only seven years ago, are now carbonizing 36 million tons of coal per annum in various parts of the world. In a brief personal foreword, Sir Arthur Duckham states the reasons why he believes that the Becker oven has proved itself during the last seven years the best type of oven available, and why he has no hesitation in offering and recommending it to the coke oven user.

The Stoke-on-Trent Corporation Gas Committee have decided to extend mains to the village of Baddeley Green at a cost of £1320.

At a meeting of the Oldham Corporation Gas Committee, the Town Clerk submitted a letter from the Ministry of Health, with reference to the re-organization of the Higginshaw Gas-Works, intimating that before deciding upon the application of the Town Council, the Minister proposes to direct a local inquiry to be held by one of his inspectors as soon as other engagements will permit.

XUM

# Topical Items.

**Progas Company** have been registered, with a nominal capital of £1000, as manufacturers of gas governors, burners, slot and other meters, gas cookers, and gas fires. Directors: J. Paterson, Claremont House, Montpelier Terrace, Cheltenham; and H. Lips.

**Heating of Rotherham Public Buildings.**—The Rotherham Corporation Gas Committee have decided to fix the charge in the case of gas required for the heating of public buildings at the same rate as that for gas for industrial purposes—namely, 2s. 3d. per 1000 c.ft.

**Lytham St. Annes Council** have confirmed a recommendation to increase as from July 1, the price of gas by 4d. per 1000 c.ft., and discontinue the discount of 2d. per 1000 c.ft. in the case of prepayment meters. The gas accounts for the year showed a deficiency of £3628, which had been taken from reserve.

**Supply of Gas in Bulk.**—At a recent meeting of the Bolton Corporation Gas Committee, the Chairman reported having considered the question of the proposed supply of gas in bulk to the Little Hulton Urban District, and reported terms and conditions upon which a supply should be afforded to such district. The terms and conditions were approved.

**Malta and Mediterranean Gas Company, Ltd.**—The Directors' report on the Malta and Mediterranean Gas Company, Ltd., for the year ended March 31 last, shows that the amount standing to the credit of profit and loss account is £25,596. The Directors propose the payment of the dividends on the first and second preference capital, and a dividend of 5 p.ct. (free of income-tax) on the ordinary capital, making with the interim dividend paid in December last 10 p.ct. for the year, and leaving a balance of £20,118 to be carried forward.

**James Keith & Blackman Company, Ltd.**—The fortieth annual report of Messrs. Keith & Blackman Company, Ltd., shows that after providing for debenture interest, payment of preference dividend, and making sufficient allowance for depreciation and reserves against doubtful debts, the audited accounts show an available balance standing at the credit of the profit and loss account of £55,369. The Directors recommend that this sum be appropriated as follows: In the declaration of a dividend on the ordinary shares at the rate of 17½ p.ct., less income-tax, absorbing £27,125; in transferring to reserve account the sum of £12,000, leaving to be carried forward to the current year £16,244.

**Workman Gives His Life for a Gas Manager.**—The inquest was held recently at Blaenau Festiniog on William John Pritchard and Thomas Gwynedd Owen, who were found dying in a manhole at the Gas-Works. Mr. Pritchard apparently descended the manhole to release water from the pipes conveying crude gas from a retort house, and failed to replace the plug, and was thus asphyxiated. Owen descended the manhole to try to rescue him. In recording a verdict of "accidental death," the jury added a rider that a better opening be made to the tank and that gas-masks be supplied. They also wished to place on record the bravery of the young man, Owen, who no doubt gave his life in an endeavour to save Mr. Pritchard.

**Gas Exhibition at Sittingbourne.**—With the idea of giving the public the benefit of free instruction and education in the art of gas cookery, the Sittingbourne Gas Company arranged a series of gas cookery lectures and demonstrations which took place at the Town Hall, Sittingbourne, recently. The actual work of organizing the demonstrations was ably undertaken by Mr. A. P. Ghent, the Secretary of the Company, and he, with the assistance of Mr. E. M. Edwards, the Company's Engineer and Manager, working in collaboration with Messrs. Parkinson, Ltd., staged a most admirable exhibition, which fully met the purpose for which it was intended. A series of lectures and demonstrations were given by Miss H. H. Tuxford, M.C.A., Diplomé, Board of Education, Gold Medallist.

**Old Leeds Gas-Works to be Abandoned.**—Negotiations are in progress between the Leeds Corporation Gas Committee and the Improvements Committee of the same authority with a view to the possibility of transferring to the latter the emergency gas-works in York Street, which have become redundant and unnecessary to the gas undertaking. The York Street works have been a stand-by which is not now needed in view of the substantial improvements made at other and larger works in the city in recent years. If the negotiations result in the transfer, the site—which is within five minutes' walk of the city centre—will be used for the erection not of houses in the ordinary way, but of what are described as "industrial flats" for the use of city workers who wish to be home for lunch. On the suggestion of the City Engineer the price is being determined by the District Valuer.

**Entertainment for 3000 Co-Partners' Children.**—Nearly 3000 children were invited to a special Co-partnership Fête, at the Crystal Palace on Saturday, June 14. They were the guests of the South Metropolitan Gas Company. A large number of sporting events were arranged for the children; and there was a tea party on a huge scale, with many and varied amusements.

**Price Reduction Recommended at Stratford-on-Avon.**—At the monthly meeting of the Stratford-on-Avon Town Council, Alderman Ballance said the sales of gas had risen by 5 million c.ft., representing an increase of 4 p.ct. The profit for the year, £1034, was better than most of the Committee anticipated, and at the next meeting a further reduction in the price of gas would be recommended.

**Clevedon Wishes it Had Kept Gas.**—At a recent meeting of Clevedon Urban District Council, strong complaint was made against the electrically lighted streets. Miss Donaldson said: "I should like to go back to gas. The streets of Clevedon could not be more dreadfully lighted than they are at present." Other councillors expressed dissatisfaction with the existing arrangements, which, however, will be continued for the present.

**Removal of Gas-Works at Hollacombe.**—At a meeting of Torquay Corporation, a letter was received from the Paignton Urban District Council stating that, subject to the Corporation agreeing to bear the remainder of the cost and to the Paignton Council being able to obtain the sanction of the Ministry of Health to a loan for the purpose, the Council would be prepared to make a contribution of 25 p.ct. of the actual cost—which was estimated at £150,000—of the removal of the gas-works at Hollacombe to another site. It was decided that the Paignton Council be informed that the Corporation did not consider that the proportion suggested was fair and equitable.

## The Institution's Visit to Wharncliffe Colliery.

During the Annual Conference of the Institution of Gas Engineers at Leeds, a party paid a visit to the Wharncliffe Silkstone Colliery Company, on June 4. The visitors were received at the Colliery by the Managing Director, Mr. F. C. Swallow, and other officials, and after luncheon many of the party proceeded underground, while others inspected the surface plant and coke oven installation.

### The Coke Ovens.

Most of the coal produced at the Wharncliffe Silkstone Colliery makes an excellent coke, while it is also rich in gas and bye-products. Its value in this respect was realized in the early years of the Company's history, and accordingly a battery of bee-hive coke ovens was constructed. The coke produced by these ovens was excellent, being of a special metallurgical quality. Waste heat in the flue gases was used for generating steam for the use of the Colliery. In these ovens, of course, the bye-products were lost, so that in 1898 a battery of 35 waste-heat bye-product ovens was constructed, which was the first of its kind in South Yorkshire. Each oven had a capacity of 8½ tons of dry slack, which was carbonized in about 48 hours at a temperature of approximately 900° C.

The experience gained with these early types of ovens enabled the Company, in 1912, to embark on a more ambitious programme. Fourteen regenerative ovens were constructed. In this case the waste heats were used to pre-heat the incoming air and gas used for heating the ovens, and in this way the quantity of sulphur gas was increased. This gas was consumed in large gas engines which produced electric and compressed air power for use in the underground workings. This was the first time surplus gas from coke ovens had been used in this manner at a South Yorkshire Colliery, and the power produced enabled the Company to extend and develop its machine mining methods. The carbonization period in these ovens was reduced to 33 hours and the working temperature increased to 950° C. The ovens were charged from the top, with about 9 tons of slack coal, and levelled by hand.

Subsequently (1919) ten more regenerative ovens were added to the battery, making a total of 24 ovens of this type. The period of carbonization was further reduced to 31 hours. About this time mechanical means of levelling the charge in the oven were also introduced. The strike of 1921 caused such damage to the old battery of waste-heat ovens that it became imperative to replace them. By 1924 a battery of 25 regenerative ovens, of the most modern type of that date, were completed. These ovens were 2 in. narrower than the first battery, and the carbonizing time was proportionately reduced.

The coal for use in the coke ovens is washed and then dried down to 7·5 p.ct. moisture by a continuous centrifugal drier. This enables the ovens to handle 10 p.ct. more coal as compared with the period previous to the introduction of the drier.

## Lord Brotherton's Library for the Nation.

**[From the "Yorkshire Post."]**

Lord Brotherton's desire that the nation should be made the ultimate possessor of his immense and precious collection of books has been understood for some time by his friends, and now it has become known that an important announcement on the subject may be expected from him when, on the 24th of the present month, he lays the foundation stone of the splendid new library of the Leeds University, the erection of which, it will be recalled, has been made possible by an earlier gift on his part of £100,000.

It is understood to be Lord Brotherton's wish that this building should be made the repository in due course of his own private library, to be housed in a section of its own, and rendered available as a national possession, through the medium of the University. The gift, it is believed, will carry with it a special endowment to cover the cost of upkeep (for this purpose a sum of £30,000 is mentioned), and the care of the books will continue to be in the charge of Mr. J. A. Symington, who, in a private capacity, has lately helped in cataloguing the thousands of volumes that compose the Brotherton collection.

The gift will form a fitting crown to the princely generosity that has enabled the Leeds University to set about equipping itself with a library for its own purpose on a scale which will have few parallels in this country.

The gift will, indeed, fulfil an aspiration that Lord Brotherton has long entertained, that the City of Leeds—of which, by the way, he is himself a Freeman—should occupy a leading position in the study of literature; and this desire of his—coupled, of course, with a zest for collecting in itself—has not been the least of his motives in amassing the many rich and rare volumes that now repose in his residence at Roundhay Hall. The catalogue of them extends to more than thirty quarto volumes.

One of the treasures supremely prized is the set of original Shakespeare folios, four in number and all in such perfect condition that they are adjudged to be the soundest copies extant. An expert has estimated their value alone at about £20,000.

## Publicity Activities at Oldham.

**A New Brochure.**

"Gas—the faithful slave." What better title could have been chosen for a brochure for the public than this which adorns the cover of a new publication by the Oldham Gas Committee. The brochure is most attractively produced under the Editorship of Mr. Ernest Parry, the Commercial Manager of the Gas Department, and it sets out to show the inhabitants of Oldham that gas, far from dying out, is making amazing progress at the present time.

The first section tells briefly of the birth of "a great industry," and indicates how the maximum conservation of our coal resources is attained on the gas-works. The story is related in simple language of the process whereby the various and useful bye-products of the coal are obtained, and the uses to which they can be put. There follow some notes on the history of the Oldham Undertaking itself, from the year 1823, when a meeting was held at the Angel Hotel for the purpose of considering the provision of gas and water supplies for the town of Oldham. The works of the original Oldham Gas Light and Water Works Company were taken over by the Corporation in 1853, since when the concern has grown enormously and affords a very striking example of progress. When purchased, the works had a capacity of 100 million c.ft. per annum; to-day the yearly output is about 1800 millions, distributed through 264 miles of mains to a population of 248,000. Other figures go on to show the great progress in other departments of the undertaking.

An interesting section deals with incandescent gas lighting, and with the new gas switch. "Gas is, indeed, the faithful slave of the housewife in the scullery and kitchen, where most of the work of the house is done." The cooker, the washboiler, the gas fire, geyser, and circulator are all reviewed in turn, while there is a special note on gas for industrial uses.

The final pages deal with the actual service the Oldham Gas Department are rendering day by day to their consumers—the laying of service pipes, the fixing of appliances, terms of hire, and maintenance service. And last, but not least, is a very useful illustrated section on "How to read your gas meter."

The whole publication is well illustrated, and contains also much useful advertising matter in connection with the up-to-date appliances that can be obtained through the Oldham showrooms. Full-page photographs are reproduced of various views of the works and showrooms of the undertaking, and altogether the brochure makes a most attractive and interesting publication, on which Mr. Parry is to be congratulated.

## British Road Tar Association Stand at Scarborough.

All interested in the construction and maintenance of roads are undoubtedly looking forward with interest to the Fourth Exhibition of Quarry and Building Contractors' Plant and Machinery, to be held at Scarborough from July 2 to 11 next.

In view of the increasing interest that is being taken in tar for road-making purposes, the Association's stand is bound to attract considerable attention. British road tar can justly claim to have been the earliest of modern road-surfacing materials, and its successful use as a binding material for all classes of road stone is unsurpassed. The theme of the display will be to present a comprehensive survey of the use of tar for road-making, and will include samples of road tar complying with the British Standard Specifications, which have been recently issued. Samples of British stone, in the tarred and untarred state, will be on view, and visitors will have the opportunity of examining the various grades of road tar used in conjunction with various types of road stone.

The Association's stand can be looked upon as being an information bureau, at which all interested in the use of tar will have an opportunity of discussing questions concerning its use and application for road-making

## "Williams'" Lamp Suspender.

High-power gas lamps, on the high or low pressure system, are winning their way to favour on a large scale. In such cases the lamps when in their normal positions are somewhat inaccessible, and have to be lowered for cleaning, &c., or, alternatively, a travelling tower has to be used, when a considerable amount of obstruction may be caused to the flow of traffic.

A new method of suspension has recently been patented by Mr. R. A. Williams, of 7, Colne Road, Burnley, which is claimed to be both simple and efficient in operation. The lamp may be arranged at any reasonable height, of from (say) 15 to 17 ft., with a cantilever span from the kerb of from 8 to 14 ft. The raising and lowering is by means of a winch and wire rope, and in lowering, the lamp travels radially to the pillar so that the lamp attendant has easy access to the lamp on the kerb and out of the danger zone. Further, a very important feature is that the gas is always on at the lamp in whatever position it may be, in which case no spirit wad is required to re-light and no flexible pipe connection is required for adjusting the light.

The lamp when in its normal position is suspended by double hooks so that the load is taken off the hoisting rope. The hanger attached to the top of the lamp automatically engages with the hooks on hoisting and *vice versa* when the lamp is lowered. The suspender gear is of simple design and can be easily fitted and adjusted by any reasonably well trained gasfitter, and is adaptable for fixing on tramway standards if required. It is understood that a large number have been installed with gratifying results.

## Robot Salesmanship.

**Portable Sound-Film Projectors.**

Firms who have used industrial silent films will be interested to learn that at last the talking film is a practical proposition. Hitherto, the cost of installing sound-film projection equipment has been too high to make it a commercial proposition. The introduction of a reliable portable sound-film projector has eased the situation, but the latest development announced by British Publicity Talking Films, Ltd., is of great importance to industrial film users, actual and potential.

The cost of a portable sound-film projector apparatus is in the neighbourhood of £1000, and, while there would be many firms who could keep one in constant use, many, on the other hand, would find that the outlay would not be justified, in view of the limited number of occasions at which the industrial film can be profitably employed.

British Publicity Talking Films, Ltd., announce that they have inaugurated a hire service for the use of firms who are desirous of employing the infinitely more effective sound-film. Briefly, the idea is that the apparatus can be hired for a day, a week, or even longer periods, at an inclusive charge including the services of operators.

The sound system employed operates from ordinary lighting mains, and, by using non-inflammable film, all requirements of the local authorities in connection with the cinematograph exhibition are met.

In addition to the hire of a portable projector for use in their own establishments, firms can arrange for their sound films to be projected at conventions, exhibitions, or even in the board-rooms of prospective customers.

## Notes from Scotland.

### Extension of Glasgow's Gas Supply.

At a meeting of the Glasgow Corporation Gas Committee, the Town Clerk reported that correspondence had taken place with the Burgh of Milngavie regarding a request that the Gas Department should lay certain mains in the Burgh, required for street lighting in new streets. The parties, however, had not been able to come to an understanding as to the liability for the cost of supplying the mains, and that following an interview with the Town Clerk of Milngavie, and having regard to the Burgh's responsibilities for the lighting of the streets, he had, without prejudice to the Gas Department's position, entered into an arrangement with the Burgh that the mains would now be laid by the Department on the express understanding that all questions as to liability for the cost of supplying and laying of the mains be reserved.

### Edinburgh Firm's Annual Outing.

The employees of Messrs. Alder & Mackay, Ltd., Gas Meter Manufacturers, Edinburgh, held their Annual Outing on May 31, when a party of fully 450 travelled by special train to Perth. A comprehensive sports programme was carried out on the North Inch in the forenoon, the afternoon being given over to sightseeing. Mr. Grant, Managing Director, and Mrs. Grant were present, also Mr. Scott, Sales Manager. The prizes were presented by Mrs. A. Wood, wife of the oldest foreman and employee. Votes of thanks to the Company for their generous support, and their interest in the social welfare of the employees, concluded a most enjoyable day, the weather being all that could be desired.

### Subsidence of Dundee Holder..

It is stated that as a result of the damage done to the new gasholder at Wellgrove, Lochee, by subsidence, the Dundee Corporation will be involved in an expenditure estimated at £9000, equal to 1½d. in the £ on the city rates.

The holder was erected a short time ago at a cost of £13,788, after the Gas Department had spent £1800 in preparing the foundations, as against £4000 to £5000 estimated by the contractors. The site chosen was a filled-in quarry.

The holder weighs 500 tons, and it also holds 10,000 tons of water.

When the water was put in for testing purposes it was found that the holder had subsided at one side by about 7½ in. The tank, on being emptied, slightly righted itself. The matter came before a meeting of the Gas Committee of the Town Council, when it was stated that although the extent of the damage was not then known it was believed to be serious.

It was decided, after the Committee had visited the site, to call in expert advice.

On May 27 Mr. Handley, representing the contractors, and Mr. Buckland, representing the Ferro-Concrete Constructional Company, Derby, visited Dundee and made a thorough examination of the tank. They were accompanied by Mr. George Baxter, jun., Water Engineer, who has been called into consultation by the Gas Committee since the mishaps occurred.

Late in the afternoon a meeting of a special committee was held, at which the experts were present.

As a result of their report it was learned that to effect repairs the tank would have to be taken down completely and rebuilt. Some parts, it has been found, were strained and distorted, and these were to be replaced. There are apparently three or four possible ways of dealing with the trouble, and these the experts are to report on. They will also submit approximate estimates, which will be submitted to the Parent Committee in the course of a few days.

It is hoped that matters will be sufficiently advanced to be submitted to the next meeting of the Town Council. A conservative estimate puts the cost at not less than £9000.

While the present proposal is to take down and repair what has been damaged and rebuild the tank, a member expressed the opinion that the cheapest course in the end would be to scrap the damaged holder altogether and replace it with an entirely new structure.

"In tackling the job by repairing the old tank," he said, "we do not know what we may be let in for. As I understand the position, we cannot get a definite estimate until the whole thing has been taken down to see what has actually been damaged. To take it down means every bolt coming out and the whole thing being conveyed to the works to be overhauled."

### Glasgow Coal Supplies.

At a recent meeting of the Glasgow Corporation Gas Committee, there was submitted from the Secretary of the Lanarkshire Coalmasters' Association a letter stating that meetings of the members of the Association have been held recently to consider the question of new contracts for the supply of coal to the Corporation Gas Department, in view of the fact that the usual buying time is approaching when new contracts are arranged, and that the position of the coal industry at the present time is so serious that the coalowners feel they require to obtain from their customers a reasonable level of price which will enable the industry to carry on. The coalowners, having carefully reviewed the position in the light of all the present circumstances, have come to the conclusion that a uniform advance of 6d. per ton on present contract prices should be conceded on new contracts about to be entered into for the year 1930-31. The Committee, after consideration, agreed that the matter be remitted to the Sub-Committee on Works and Distribution with power to negotiate with the Association on lines indicated.

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# Corporation Undertakings' Results for 1929-30.

### Blackburn.

The annual report of Mr. G. P. Mitchell, Manager of Blackburn Corporation Gas Department, shows that the quantity of gas made during the year was 1,126,577,000 c.ft.—a decrease of 15,753,000 c.ft., or 1·38 p.ct. on 1929. Ordinary meters registered 449,152,900 c.ft. against 477,984,500 in 1928-29 and 460,808,500 in 1927-28; prepayment meters 482,904,400 against 482,154,700 in 1928-29 and 477,671,000 in 1927-28; industrial purposes 53,457,900 against 47,620,900 and 39,314,000; public lighting 57,456,300 against 53,662,100 and 52,316,800; works, offices, &c., 9,500,000 against 9,833,600 and 11,113,000; unaccounted-for gas 74,105,500 against 71,074,200 and 81,496,700. Ordinary meters consumed 39.88 p.ct.; industrial meters on rebate 4·75 p.ct.; gas-works 0·84 p.ct.; prepayment meters 42·86 p.ct.; public lighting 5·10 p.ct.; and unaccounted-for gas 6·57 p.ct.

The wages paid were £49,483, equal to 11·4d. per 1000 c.ft. of gas sold, £4275 being included for work on the foundations for new boiler house and telpher plant and extensions of mains and services for new housing sites, &c.

Despite trade depression, sales of appliances and fittings effected through the showrooms exceeded all expectations. The value of business done during the year was £20,502 against £19,271, an average weekly amount of £400. The amount outstanding on hire-purchase agreements remained at £52,224, representing 12,516 creditors. In 1920-21 there were 36,983 cookers, boilers, &c., and in 1929-30 61,808.

The expenditure during the year on mains and services was £13,256, against £13,483 the previous year. The number of new services was 550, and the number of services renewed 750.

Some 55,920 tons of coal were used in carbonization against 57,695 tons. The total expenditure was £147,530 against £151,840, and the income was £212,366. After meeting necessary charges there remained a net profit of £5695 for appropriation. The decrease of income from gas sales was £3580, the reason being the general state of the staple industry and milder climatic conditions. Residuals showed a decline of £5270, owing to the slump in tar and sulphate of ammonia.

In expenditure, coal cost was down £2923. Rates on assessment of the undertaking have increased £4000, the amount paid being £18,127 against £9261 in 1920.

### Lincoln.

The Lincoln Corporation's gas undertaking last year made a gross profit of £12,621—a decrease of £6258 as compared with the previous year. After deducting debt and interest charges, there was a net profit of £3993, whereas in 1928-9 this was £10,281.

There was a fall in the income of £1779, due to the reduction of 3d. per 1000 c.ft. of gas. Working expenses increased by £4478, accounted for by the increase in the amount of gas sold and by the increased rates consequent on the reassessment of the undertaking. The value of the works, plant, &c., after allowing for depreciation, is put down at £331,033.

At the Lincoln City Council meeting, Councillor A. L. Bower pointed out that in the next few years they would be

involved in rather heavy expenditure on the gas undertaking. The amount spent on the plant in the past few years had been so small that it had not been possible to keep the works up to modern requirements.

Also, in the next few years, they would have to close the Newland works for gas-making purposes, which would mean the plant at Bracebridge would have to be considerably increased.

### Nelson.

The expenditure on revenue account during the year ended March 31 last has been £107,312, or £14,021 more than the estimated expenditure; while the income has been £109,057, or £4044 less than the sum estimated. The result is a gross profit of £19,380, and a net profit of £1744. During the year 27,318 tons of coal have been carbonized; 19,572 tons at the Brierfield Works, and 7746 tons at Nelson. The number of men employed by the Department has varied from a maximum of 179 to a minimum of 168.

The total quantity of gas made during the year has been as under:

| | C.Ft. |
|---|---|
| Coal gas made at Nelson Works | 145,279,000 |
| Coal gas made at Brierfield Works | 404,342,000 |
| Carburetted water gas | 32,642,000 |
| Total | 582,263,000 |

The gross income from residuals and bye-products has been £14,249, as compared with £17,360 obtained the previous year, and after deducting all the expenses of manufacture and handling of same, the net income from this source amounts to £10,296, as compared with £13,453 last year, which gives a return of 7s. 6½d. per ton of coal carbonized, as compared with 9s. 3d. last year.

The total quantity of gas delivered during the year has been 582,323,000 c.ft., being a decrease of 3,043,000 c.ft., or 0·52 p.ct., on the quantity delivered last year. The unaccounted-for gas has decreased by 6,117,000 c.ft., and now stands at 4·14 p.ct. of the total quantity of gas made, as compared with 5·17 p.ct. last year. There are now a total of 17,226 consumers; 6557 of these have ordinary meters, and 10,669 are provided with prepayment meters; being an increase of 277 consumers during the year.

### Oldham.

The annual report of the Superintendent of the Corporation of Oldham Street Lighting Department for the year ended March 25 last shows that the Department are responsible for the lighting of 112 miles of roads in the Borough.

The following figures show the consumption of gas and electricity for the years ending December:

| — | Gas. | Electricity. |
|---|---|---|
| | C.Ft. | Units. |
| 1924 | 110,738,000 | 562,984 |
| 1925 | 92,681,000 | 548,666 |
| 1926* | 60,215,000 | 521,259 |
| 1927 | 74,872,000 | 622,573 |
| 1928 | 74,019,000 | 698,124 |
| 1929 | 74,220,000 | 728,371 |

* Coal strike.

It is stated that automatic controllers are being used as a means of economizing gas after midnight, the saving during the past year from this source being 22 million c.ft.

The lighting installation comprises 912 electric lamps of varying power, 73 1500-c.p. high-pressure gas lamps, 361 high-power low-pressure gas lamps, and 3581 low-pressure gas burners in ordinary lanterns, making a total of 4015 gas lamps.

### Rotherham.

Mr. T. R. Cook, Gas Engineer to the Rotherham Corporation, in his annual report, states that during the year the total gas consumed in the Rotherham area of gas supply amounted to 627,835,000 c.ft., as against 505,029,000 c.ft. sold during the year ended March 31, 1929, giving a total increase of 122,806,000 c.ft., or of 24·31 p.ct. during the year. The total amount received on gas sales was £66,616. The reduced charges have benefited the industrial gas consumer to the extent of £1177, but it is interesting to note that there has been an increase in the total revenue of £3910, due to the increase in the sale of gas in the area of supply. There has been a decrease in the sales of gas to the ordinary consumer of 7,613,000 c.ft., largely due to the intensive electricity competition with the assisted wiring scheme, but, as against this reduction, an increase of 18,728,000 c.ft. has been obtained through the prepayment consumers and an increase of 26,485,000 c.ft. through the industrial consumers, while the sales of crude gas have recorded an increase of 79,255,000 c.ft. There was a net profit of £9530.

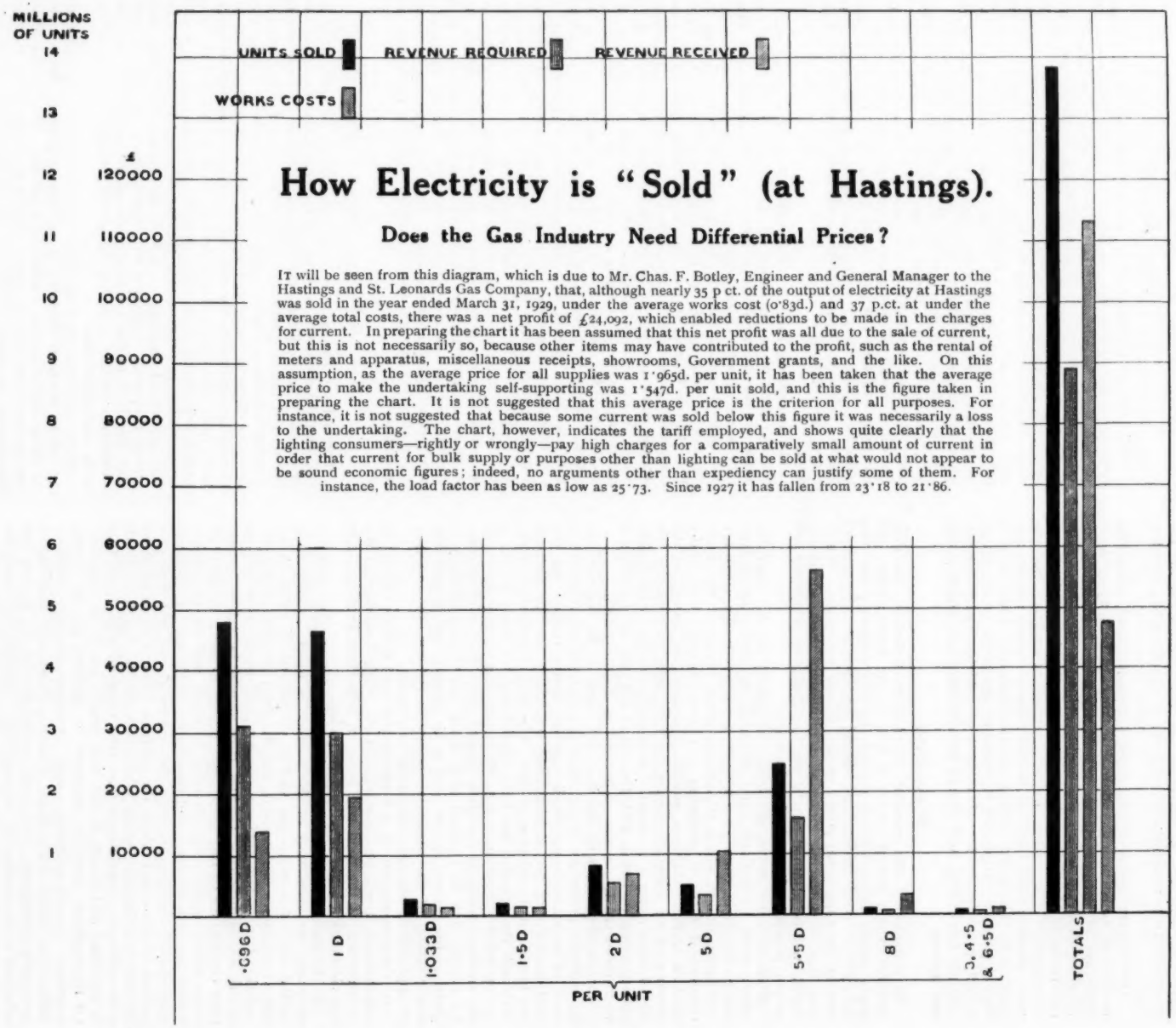
The Town Clerk has successfully negotiated with Messrs. John Brown & Co. for the purchase of the Rotherham Main Gas Undertaking, and after acceptance of the purchase price and general conditions by the Council, the Department have now taken over the whole area of gas supply in the parishes of Brinsworth and Whiston, which includes the supply of gas to 605 consumers, together with all the street lighting. In conjunction with the purchase of this undertaking, the Town Clerk has negotiated for a new agreement with Messrs. J. Brown & Co. for the purchase of crude coke oven gas for a further period of ten years, which will be of benefit to the Council. The Gas Committee have carried out the policy of the sale of new gas fittings on the hire-purchase system, and during the year 8700 new gas fittings have been fixed in consumers' premises. The total number of new lighting fittings fixed during the past two years has exceeded 17,000, representing in value £4250, and it is estimated that 4000 fittings will be installed during the year 1930-31, making a total of 21,000.

### Stourbridge.

The sales of gas have been practically stationary during the year, for although a considerable number of new houses have been built, the general state of trade has been very bad. The gas unaccounted for shows a slight improvement.

The revenue account expenses do not vary much from the previous year, allowing for natural fluctuations. The income from the sale of gas has increased by about £336, while the rental of meters and stoves is also slightly up. Coke improved greatly, particularly during the second half of the year, while tar depreciated, the figure for residuals being £372 less than before. The total receipts for gas and residuals were practically the same as in 1929. The gross profit is £22,063, a decrease of £633. The balance from revenue account is subject to the usual deductions for income-tax, annual instalments, expenditure on mains, services, &c. The surplus, after these deductions, is £4233—an increase on last year of £322.

The new section of vertical retorts has been in continuous work throughout the year, and has given very good service, as has also the original section, which has now been at work over eight years.


MILLIONS OF UNITS
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UNITS SOLD
REVENUE REQUIRED
REVENUE RECEIVED
WORKS COSTS
How Electricity is "Sold" (at Hastings).
Does the Gas Industry Need Differential Prices?
IT will be seen from this diagram, which is due to Mr. Chas. F. Botley, Engineer and General Manager to the Hastings and St. Leonards Gas Company, that, although nearly 35 p ct. of the output of electricity at Hastings was sold in the year ended March 31, 1929, under the average works cost (0·83d.) and 37 p.ct. at under the average total costs, there was a net profit of £24,092, which enabled reductions to be made in the charges for current. In preparing the chart it has been assumed that this net profit was all due to the sale of current, but this is not necessarily so, because other items may have contributed to the profit, such as the rental of meters and apparatus, miscellaneous receipts, showrooms, Government grants, and the like. On this assumption, as the average price for all supplies was 1·965d. per unit, it has been taken that the average price to make the undertaking self-supporting was 1·547d. per unit sold, and this is the figure taken in preparing the chart. It is not suggested that this average price is the criterion for all purposes. For instance, it is not suggested that because some current was sold below this figure it was necessarily a loss to the undertaking. The chart, however, indicates the tariff employed, and shows quite clearly that the lighting consumers—rightly or wrongly—pay high charges for a comparatively small amount of current in order that current for bulk supply or purposes other than lighting can be sold at what would not appear to be sound economic figures; indeed, no arguments other than expediency can justify some of them. For instance, the load factor has been as low as 25·73. Since 1927 it has fallen from 23·18 to 21·86.
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8D
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TOTALS
PER UNIT
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# Coal Tar: With Special Reference to Road Works.

By W. E. CONE, Technical Adviser, British Road Tar Association.

**[From a paper presented at a meeting of the Northern Irish District of the Institution of Municipal and County Engineers at Belfast, June 12. The meeting included a visit to the Belfast Gas-Works.]**

It is interesting to note that the quality of tar for road-making has consistently been improved, as evidenced by a perusal of the specifications issued since 1911. The present British Standard Specification for tars Nos. 1 and 2 for road purposes* was prepared by the British Road Tar Association, and is more exacting in its schedule of requirements than the specifications previously issued. The methods of testing, and specifications for apparatus contained in the appendices of the Specification, have been specially prepared by the Standardization of Tar Products Tests Committee, and form a valuable work of reference.

The determination of the most economical and efficacious method of construction and maintenance to be employed on highways of various classes constitutes one of the most interesting subjects which the engineer has to consider. The real measure of efficiency in road construction is not the finest thoroughfare that can be built regardless of expense, but the most effective road that can be built for a certain definite expenditure. There are several essential qualities which a road should possess. It should be durable, noiseless, easily maintained, non-slippery for all classes of vehicles under varying climatic conditions, and should be economical in construction and upkeep.

## FOUNDATIONS.

In considering the question of road construction, the first problem which presents itself is that of the foundations. All loads must ultimately be carried by the subsoil, and the strength of road foundations should be increased in proportion as the supporting power of the subsoil decreases. Whatever type of surfacing material is ultimately used, successful results will be attained only if the foundation is adequate, and proper provision is made for drainage.

Broken stone roads are built extensively in all countries where stone is available, and although the water-bound type can no longer be considered suitable for heavy traffic, there are conditions under which it will continue to prove the most economical type of surfacing A water-bound road under modern traffic conditions quickly disintegrates, owing to the absence of an adequate binder, and in order to conserve the life of these roads it is essential to treat the surface with a suitable dressing material, with the object not only of providing a waterproof crust, but also of preventing disintegration.

Surface dressing with tar has now come to be regarded as an essential procedure in the efficient and economical maintenance of all water-bound roads carrying motor traffic, and the continued use of tar in increasing quantities for this purpose has borne out the wisdom of those who first conceived the idea. Although the practice has been established for many years, it is somewhat surprising to note the haphazard manner in which the surface tarring is too often carried out. The most successful results will be realized only when every consideration is given to the nature of the road to be treated, the preparation and cleaning of the road, the quality of the tar, the methods of application, and the subsequent treatment.

In the preparation of a water-bound road before tarring is commenced, it will be apparent that the original method of the construction of the road will have an important bearing upon the character of the resultant surfacing.

In the case of a macadam road constructed of large particles of stone, the treatment of the surface is much simpler than in the case of a macadam surface, composed of small stone. The large stones are exposed, and the layer of dust, so characteristic of macadam surfaces composed of small stone is thus practically eliminated. Greater care should be taken to prepare the surface of this latter type, owing to the probability of there being considerable detritus between and on the stone, which prevents adhesion and penetration of the tar. Consideration should also be given to the chemical and physical properties of the stone, since the surface textures of road stone are widely different. Stone which is hard and tough demands a tar of higher consistency than that required with stone that is not hard and tough, if the best results are to be obtained. Of the methods generally employed in applying the tar—hand-pouring, gravity-painting, and pressure-spraying—opinions differ as to which is the best. The use of pressure distributors is rapidly developing, but local conditions usually govern the adoption of the method to be employed. Immediately after the tar is spread or sprayed, and while still hot, a top dressing of approved gritting material, free from dust, and of $\frac{3}{4}$ to $\frac{1}{2}$ in. gauge, should be employed in liberal quantity, and pressed into the tar dressing by the use of a light roller. Chippings were originally spread with the idea of rendering the road safe for the immediate passing of traffic, but it is becoming more and more recognized that they form an appreciable carpet with the tar, thereby adding considerably to the life of the road.

In this connection thousands of miles of water-bound macadam roads have been built in various parts of the country, many of which have been allowed to deteriorate, and are rapidly approaching a condition of impassability. The use of tar as a surface dressing makes it possible to conserve the life of these old roads, and enables them to carry a surprisingly large amount of traffic.

## SURFACE TREATMENT.

The surface treatment of a tarmacadam road does not present the same difficulties as that of a water-bound road, although it is equally essential that the same care should be taken in the preparation and cleaning of the road before tarring is commenced. It is advisable to use a tar of equal or somewhat higher viscosity for the surface treatment than that comprising the binder in the undercoat, and, as in this case adhesion rather than penetration is required, care should be taken to avoid an excess of tar, and to apply it as evenly as possible. The top-dressing should be carried out in the same manner as described above for water-bound roads.

It is a mistaken policy to surface-dress tarmacadam annually, irrespective of whether a new dressing is necessary or not. Many of the distorted surfaces of tarmacadam roads are the direct result of this practice, which causes gravitation to the sides and forms waves owing to the road being saturated with tar. The life of a tar surfacing and its economical use depend primarily upon traffic conditions, atmospheric influences, the methods of construction, and the quality of the tar used.

The increasing mileage of concrete roads has given rise to consideration of the question of their surface treatment, and while numerous treatments have been suggested and tried, they have usually failed because the substances used did not penetrate into the concrete, but peeled off, thus exposing the concrete surface to the destructive action of external agencies. The British Road Tar Association has been investigating the surfacing of concrete roads with tar through certain experimental work of two of its members, and the results so far achieved are very promising. The treatment consists of applying a prime coat of liquid creosote to the clean dry surface of the concrete, brushed out to 15 to 20 square yards to the gallon. After an interval of twenty-four hours, tar complying with the No. 1 Specification is applied in sufficient quantity to seal thoroughly the entire surface. A top-dressing of approved gritting material, free from dust, and of $\frac{3}{8}$ to $\frac{1}{4}$ in. gauge, is then applied. The prime coat of creosote enters and protects the cement and the individual particles of aggregate, while the seal coat of tar remains strongly adhesed on the surface and so prevents any seepage of water into the concrete. It is essential as part of the preparatory work that the laitance of newly constructed concrete roads should be removed by brushing with wire brooms before surface dressing operations are commenced.

## TAR FOR EXISTING SMOOTH SURFACES.

Throughout the country tarred surfaces are becoming increasingly recognized as being by far the safest for all classes of traffic. In addition, the non-skid properties conferred by the use of tar on existing smooth-road surfaces are now universally admitted. Where this latter treatment is carried out, a tar of high viscosity can be used with advantage. The tar should be applied to the prepared surface at a high temperature, care, however, being taken to avoid such overheating as would destroy its properties, and the gritting material should be immediately pressed into the tar dressing by the use of a light roller. Chippings of $\frac{3}{4}$ to $\frac{1}{2}$ in. gauge should be used, and if the work is carried out expeditiously it will be found that the heat in the tar has rendered the surface of the road sufficiently plastic to enable the gritting material, after rolling, to be embedded in it.

Many varieties of stone and slag are used for tarmacadam, and there is much diversity of opinion concerning the qualities of these materials for treatment with tar. For tarmacadam, the selected mineral aggregate should be tough so as to resist the impact shocks of traffic; it should have a good resistance to wear, and should break with a rough angular fracture. The use of too large aggregate or aggregate of too uniform size should be avoided.

In the manufacture and laying of tarmacadam the various sizes of aggregate should be accurately measured in proportions previously determined by laboratory tests, so as to secure inherent stability, density, and the minimum amount of voids. The selection of road tar which complies with the British

* British Standard Specification for tars (Nos. 1 and 2) for road purposes. British Engineering Standards Association, 28, Victoria Street, S.W. 1.

Standard Specification for tar No. 2 should be based on securing the maximum adhesive and setting properties, taking into consideration the nature of the aggregate to be used, and the conditions under which the tarmacadam is to be manufactured and laid. Careful consideration should be given to ensure that the aggregate is thoroughly dry before applying the tar, and it is better to have the heat in the tar than in the stone, because of the greater ease with which it can be controlled. The necessary temperatures should be determined largely by the sensible heat of the aggregate to be treated with tar and by the mode of its application. The most successful results with tarmacadam will be realized only when every consideration is given to the materials employed, the methods of their manufacture, and their constructional use on the road.

It is recognized that there may be difficulties in cold weather in unloading tarmacadam made with high-consistency tars. This contingency can be overcome by mixing and laying the material hot. The development of hot-mix process tarmacadam, in which the British Road Tar Association are very much interested, is making rapid strides, and holds out great possibilities for the construction of roads capable of carrying heavy traffic.

The salient features of the process are the use of a much higher consistency tar, graded mineral aggregate with the minimum amount of voids, high temperature mixing, and the laying of the material hot. Under these conditions the traffic can be turned on to the road immediately on completion of rolling.

### GROUTED MACADAM.

Grouted macadam, or the penetration method of road construction, has largely been superseded by tarmacadam, but still has a considerable vogue in those districts remote from tarmacadam works. A grouted macadam road is constructed by laying approved untarred mineral aggregate upon a prepared foundation to sufficient depth to provide a consolidated thickness of from 2 to 4½ in. dependent upon the nature of the traffic the road will have to carry. The mixed grade aggregate is spread to the desired thickness, and lightly and slowly rolled into place. Tar is then applied, usually a soft coal tar pitch, by pressure or by hand, the surface being finally covered by approved gritting material and then compacted by rolling.

Good progress has been made with tar emulsions for surface dressing, patching, and reconstruction of roads, and a number of preparations are being used with success.

Stimulated by the immense development of motor transport, the progress of road tar during the last decade has been rapid. In tar we have a material which holds a very high place in the road-making world, not only because it combines in itself those qualities which are essential to the best road surfacing, but notably because of the economies that can be effected by its use. In no small degree, in fact, the tar road may claim to have contributed to the enormous advance in motor transport, since without suitable carriageways many of the achievements of modern motor vehicles would have been impossible. Probably the greatest factor in the promotion of good roads is the dissemination of knowledge concerning the materials available, the steps which should be taken in the preparation of such materials, and the best methods for their utilization.

Scientific, experimental, and practical work on road tar is constantly receiving the attention of the British Road Tar Association, and it is hoped that the results will be of increasing value to the road industry.

# The Ceramic Society and the Josiah Wedgwood Bicentenary Celebration.

Much of the time was necessarily taken up with various ceremonial and other special proceedings, and, although the morning and afternoon of the third day were devoted to joint and separate meetings of the several sections of the Society, there was very little time for discussion of the few papers presented, and, as it happened, the papers had practically no direct bearing on refractory materials.

It cannot, however, be out of place to recall that Wedgwood himself made a very important contribution to the subject of refractories by the invention of his pyrometer (or "thermometer," as he called it) for measuring very high temperatures. This instrument rendered valuable service for a long period, notwithstanding certain unavoidable imperfections.

Among the contents of Part I. of the Wedgwood Bicentenary Commemoration Volume are some papers of considerable interest to those concerned with refractory materials, including the following:

*The Plasticity of Clay. Part I., Mechanical Methods of Measurement. By S. R. Hind. Part II., The Effect of Non-Plastic Additions on the Mechanical Properties of a Plastic Clay. By S. R. Hind and E. P. Degg.*—An important result of the investigation is the discovery that among clay-grog mixtures, a mixture containing 60 p.ct. grog gives the relatively safest drying, maximum density, and minimum porosity in the dry state, and tends to be freest from inherent stresses which affect the soundness of the finished article.

*Changes in Thermal Expansion Characteristics during the Burning of a Silica Brick.*—In this paper, by Dr. J. A. Sugden and Prof. J. W. Cobb, of Leeds University, the authors consider how far the behaviour of a silica brick in use, particularly its reversible expansion, depends on the stage to which its firing in the kiln during manufacture has been carried. Numerous experiments were made, and the indications of the results obtained are discussed. The authors have not been able to calculate reliable figures for the mineralogical composition (quartz, cristobalite, and tridymite) of a silica material from the shape of the expansion curve. In some degree the results show the interconversion of the three forms of silica, and point also to the fact that the good qualities of a well-fired silica material lie in some property other than that of the thermal expansion. Consequently, a study is being made of the changes in torsional strength and elasticity of a silica material during the burning process.

*Improvements in Preparing and Moulding Refractories especially for Manufacturing Large Blocks.*—Dr. H. Ackermann and Dr. H. Knuth in this paper describe a new method—called the S.u.G. process—of manufacturing refractory bricks and blocks, which has been developed in Germany within recent years. Details have hitherto been published almost exclusively in the literature of patents, and a coherent description appears for the first time in this paper of the scientific and technical features involved in the process.

The process is based on the fact that by mixing clay in the state of a colloidal solution with a suitable quantity of grog, a body of low plasticity may be obtained, of consistency similar to that of dry-press mixtures, and when this mixture is moulded by beating, stamping, pressing, or any other suitably strong mechanical action, the bonding effect is extraordinarily good. The moulded blocks are of very exact shape, which they retain throughout the later stages. The percentage of water in the new body is very low. The increase in bonding effect of substituting a colloidal clay solution for a clay-water-slurry is attributable to the much finer state of the clay particles in the former, and consequent increased surface. Details are given as to the actual carrying out of the process. Results of tests for crushing strength of different bodies are also given, as well as comparative water content, shrinkage, and other properties. The same method is applicable with the use of super-refractories instead of grog.

*A Note on Differences between the Interior and Exterior Portions of Fireclay Products consequent on the Firing Operation.*—In this note A. T. Green calls attention to the influence of carbonaceous matter and iron compounds, and also of vitrification. The effects of cooling treatment are also discussed briefly.

He points out that the data quoted indicate differences in the nature of the reactions which take place on the exterior and in the interior of fireclay shapes. These differences result in some variations in the property of different portions of the product, which, depending on the control of the firing operation, may or may not have subsequent detrimental influences.

*Some Experiments with Indian Sillimanite.*—Under this heading, J. H. Chesters and W. J. Rees give an account of experiments made with commercial material produced by the calcination of cyanite from India. It has been found that the final products are identical whether cyanite, sillimanite, or andalusite is used. These three minerals have practically the same chemical composition. Bricks were made with and without the addition of ball clay or calcined alumina to the calcined cyanite. The investigation is being carried on by further experiments.

*A Preliminary Investigation of the Magnesia-Zircon Series.*—W. J. Rees and J. H. Chesters conclude from the results of their preliminary investigation that the simplest explanation of the results can be based on two assumptions: (1) That maximum melt formation occurs with a mixture of about 20: 80. (2) That a new mineral is formed when magnesia and zircon are heated together, and that this occurs best with a mixture of about 50: 50. The formation of such a mineral has been confirmed by X-ray and microscopic work. It is suggested that this mineral is probably a magnesium zirconum silicate. Some of the properties of the refractory compensated mixture are discussed, including thermal expansion and slag resistance, &c.

# Gaseous Fuel in New South Wales.*

By ROY J. BENNIE.

Gaseous fuel stands pre-eminent in industry. The high thermal efficiency of its industrial applications, the low capital cost and compactness of gas-consuming appliances, and the low attendant labour cost, all render gas the ideal fuel. Moreover, in industry the amount of material rejected after heat treating—perhaps after much expensive work has been done upon it—is a most important factor in favour of the accurate control obtainable with gaseous fuel. No comparison of relative heat contents in various classes of fuels can truly evaluate their relative merits. So many commercial factors enter into the question, as was shown in the case of the pulverized fuel. That is why, in a restricted field, the use of electricity for special industrial heating is a justifiable procedure. That town gas—which necessarily is expensive as compared with raw coal—is being more and more used in industry, shows that industry is awake to its merits. Both large and small factories use it. Even in brick kilns near Chicago its use is reported. Gas firing greatly increases the percentage of "facing" bricks produced owing to the perfect control of temperature and atmosphere. Hence the brick works are content to pay 5s. per million B.Th.U., whereas in that district the equivalent heating value in coal would have cost them 7d. The gas consumption varies between 2000 and 5000 c.ft. of gas of 540 B.Th.U. value per 1000 bricks made, depending on the nature of the shale from which the bricks are being made. Alternatively, if coal were used, the fuel bill would have been about half the gas bill. Yet the superior control and better quality of product dictated the use of gas.

A great source of gas, and one of growing importance in New South Wales, is the coke oven. For blast furnaces, foundry cupolas, and metallurgical works a coke of extreme density and hardness is essential. This is made by heating finely granulated, selected bituminous coals in bulk in large ovens for eighteen or twenty hours per batch, but in later patterns for eleven hours. When these works are remote from any gas company, or factory disposed to purchase the gas, some of the gas is used to heat the ovens, and the rest is wasted. Otherwise, some coke could be consumed in producers for heating the ovens, and all the gas could be piped to the consumers. Very often these coke ovens are attached to steel works, which consume all the coke in the blast furnaces, and most of the gas is used for furnace heating and power raising. Much of the coke produced in New South Wales is made in non-recovery ovens, where all the gas and bye-products are wasted.

At this point the gas supply system of the Hudson Valley Coke and Products Company is well worth mention, for it shows how economic factors, alone, determine the best method of gas production and the calorific value of the public gas supply. This corporation manufactures pig iron from iron ore; it makes coke in coke ovens, and sells the gas and some of its coke to six neighbouring cities with an aggregate population of more than 400,000. All bye-products are conserved. The plant is very elastic. If there is an excess of coke due to a slump in pig iron, carburetted water gas is made with the coke, and the ovens are heated with water gas. If there is a shortage of coke and a limited demand for gas, they can burn coal gas to heat the coke ovens. The gas output of this plant is approaching that of the total metropolitan supply of Melbourne. This is only one of many similar undertakings, some of which are of far greater magnitude.

In New South Wales over one million tons of coal annually is converted in ovens to coke; and although most of the gas from the bye-product ovens is now consumed in the adjacent steel works, it is of quality suitable for long-distance transmission to city consumers, and the equivalent amount of heat required by the steel mills could be made in water gas producers. If the ovens were heated with producer gas, the amount of coal gas made—about 12,500 millions annually—would be far more than enough for the whole Sydney metropolitan supply. Its ultimate use in such a manner, and for the reticulation of neighbouring towns, is only a matter of time. Also, the amount of waste heat from these ovens would raise enough steam to generate 112 million electrical units annually, or nearly one-seventh of the total power supplied in New South Wales by central stations. This is available for the rolling mills, but so far it is not used in New South Wales.

### SCIENTIFIC TREATMENT OF BROWN COAL.

Blessed with brown coal deposits of exceptional magnitude, Victorians should watch with extreme interest all researches in the scientific treatment of this material. It has infinite possibilities for gas-making, and for the extraction of valuable oils and chemicals.

Out of the innumerable variation in methods of treatment one might conceive, for instance, the following procedure: The high or low temperature carbonization of the dried brown coal, conserving the oils and ammonia, and producing a gas containing from 20 p.ct. to 50 p.ct. of carbon dioxide. The char could then be fed into special water gas producers; and when incandescent the carbon dioxide laden gas could be blown through it with the steam, thus converting the dioxide to monoxide. Part of the char may be fed to plain water gas producers and carburetted with suitable oils extracted from the tars, or else possibly methanated by the catalytic process. By the above process a conservative estimate of the amount of gas produced from one ton of 85 p.ct. dry brown coal would be from 25,000 to 30,000 c.ft. of about 350 B.Th.U. value if unenriched.

Gas should be considered as stored heat, and there is no advantage in enriching it beyond the point where the economic transmission of heat has been attained.

This leads to the consideration of the best site for a gas-works consuming brown coal. The best situation for a gas-works is dependent mainly on the convenience of getting its coal and of disposing of its bye-products. If the coal cannot yield coke, or if the coke is all consumed, there is no advantage in placing the gas-works near the consumers. The best site is then at the pit head. A modern gas-works, using existing processes and converting all its coke, or char, to gas is capable of yielding quite two-thirds of the heat of the coal in its final products. But in a central works, large enough to warrant careful consideration of every economy of power and heat, higher output could be attained. In addition to this, the recovered waste heat of the process could generate more than enough power to work the process, leaving a surplus to generate electricity for bulk supply to those carrying out electric distribution. Hence we see in U.S.A. and Germany, in particular—but also in the United Kingdom—that frequently gas and electricity are generated and purveyed by the same authority. Usually in such cases some of the coke, or char, is consumed for electric generation.

Where the coke is not sold, there is no appreciable advantage in placing the gas-works near the consumer rather than at the pit head; for transmission of gas in bulk over long distances offers no difficulties. Where the main is laid in soft ground—with careful design—bulk transmission of large quantities of cubic feet, including all interest, maintained, and pumping gas over (say) 100 miles would cost less than 2½d. per 1000 c.ft. This low cost may surprise many engineers, but it is due to recent advances in gas transmission practice. The load factor of domestic gas consumption is low like that of domestic electricity; but gas has the advantage of cheap storage, which costs about 1d. per 1000 c.ft. sold. The load factor of Yallourn electric power house is less than 60 p.ct. This means that it is necessary to instal plant capable of generating at least one-and-two-thirds the average demand. But a gas-works, owing to storage, is able to preserve an even pace, and hence its capital cost is all the less. In long-distance, high-pressure transmission systems the trunk mains have a storage capacity in themselves which effectively lessens the total storage cost. But, assuming that the gas-works were at the pit head or near a central electric power house, the transmission cost of the gas would be lessened on account of storage; for gas could be stored and pumped from the works during periods of low power station load; and thus, increasing the load factor of that station, the gas-works could purchase its power at below the average generating cost. Another feature of importance is that the transmission of gas to the metropolis is cheaper than the transmission of the electricity which the gas could generate, and therefore it would pay to transmit the gas to the metropolis and use some of it for power raising either in large gas engines or under modern boilers at a central station. There would be no difficulty in finding plenty of cooling water in the metropolis for the future power stations.

### GAS-WORKS AT THE PIT HEADS.

Much consideration is being given to the question of installing gas-works at the pit heads in Great Britain; and meanwhile a general linking up of coke ovens and gas-works is proceeding in Germany, where already over 300 miles of trunk connecting mains are completed. In order that this system may work effectively it is necessary to have a reasonably steady market for all the products concerned; but it is only necessary to bear in mind the system of the Hudson Valley Coke and Products Company and other larger organizations—already referred to—to be assured of the feasibility of any such scheme. Such co-ordination may be expected in the future in New South Wales.

Victoria, possessing very limited beds of bituminous coking coals, is faced with a different problem. Either it must generate its gas from bituminous coals, imported from other States,

* From a Presidential Address before the Victorian Institute of Engineers, March 26, 1930.

or else convert its brown coal to gas. In the former case there is nothing against generating all the gas at the chief seaports and pumping it to the various foci of distribution, converting as much coke to gas as the market demands. But far more enticing is the proposal to utilize the coal resources of this State. Therefore, all the researches in this and other countries on the processing of brown coal should be followed with extreme interest. The trend of development in the most advanced countries is towards the complete gasification of all solid fuels; that is, apart from a proportion which will continue to be used in the furnaces of large boilers. For example, pulverization is increasing the use of low-grade fuels, and over 26 p.ct. of the fuel used in central power stations in U.S.A. is pulverized. Assuming that about one-quarter million tons were consumed in remote places, this would entail at present the complete gasification of about one-and-one-quarter million tons equivalent of black coal per annum in Victoria. The erection of such works and reticulation system presents no problems other than those common to the establishment of existing installations. Its ultimate realization may be confidently anticipated.

# Institution of Gas Engineers.

## Written Contributions to the Discussions on the Papers Presented at the Annual Meeting in Leeds.

### MR. PRENTICE'S PAPER ON WATERLESS GASHOLDERS.

Mr. J. W. SCOTT (Messrs. R. & J. Dempster, Ltd.), in a written communication, stated: The President is to be congratulated in persuading Mr. F. Prentice to express his views upon waterless gasholders, for it is to him we must turn for the best practical experience in our country, and his paper and supplementary remarks clearly show that he has no personal regrets in having recommended his Board to instal a waterless gasholder at Ipswich.

When I visited the Continent to inspect waterless gasholders, before my firm decided to undertake their erection, I was struck with the fact that all the guide carriages were amenable to examination and adjustment from the piston, and a comparatively small number of guide rails required. At Ipswich there are, I believe, 36 carriages for a 2-million holder, whereas a four-lift spiral holder having a similar capacity would require 92 carriages, and a 2-million guide-framed holder about 216 carriages; but half of the latter, after a few years' working must be taken upon trust, for they can only be inspected when the water is removed from the tank.

It has fallen to my lot to find many cup and bottom curb rollers in the bottom of a tank when removing framed holders and substituting them with the spiral type. As time goes on, I am more and more impressed with the fact that the inventor realized that a flexible seal was essential for his waterless type, and so far experience has proved that his introduction of the sailcloth, or, as it is more generally termed, "canvas" seal, has not only proved satisfactory, but it also ensures a minimum pressure between the moving piston and the shell. Doubtless when adapting the tar sealing medium he also had in mind that it should serve several purposes—namely, providing the seal for the gas, a lubricant for the slipper plate, and a preservative for the steelwork forming the vertical sides of his vessel.

It is no simple problem to lubricate the outer rim or contact seal of a waterless gasholder, for at Ipswich its length will be about 400 linear ft.; so what finer medium would you require for this purpose than suitably prepared tar?

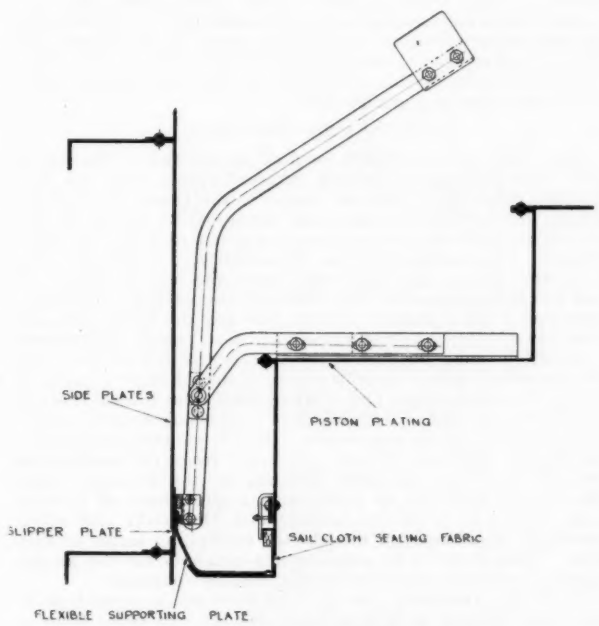
I think very highly of his stiffened rigid uprights, having the projecting flange inside to form a path for the guide roller carriages. By these projections any turning movement of the piston is easily prevented. I admire the ingenuity he displayed in carrying his sliding plate past the projections at the stanchions, ensuring the freedom and elasticity of this plate and yet maintaining the moving seal.

As Mr. Prentice has made reference to a new seal support, the sectional drawing herewith through the piston steel will readily explain the idea. The supporting medium can be of soft Swedish iron or other material of a flexible character, secured to the back of the slipper plate, but with a free outer edge resting upon the outer rim of the piston. The sailcloth is attached as shown, and retains the tar seal in precisely the same way as heretofore. The supervision costs given by Mr. Prentice, and referred to by speakers during the discussion, appear to show a good credit balance in the case of Ipswich. Here we find that within twelve months the number of fitters necessary on the distribution side when supplying gas from water-filled tanks were reduced by three. If we take the cost of each fitter at £150 per year, it more than covers any cost for electricity and supervision on the waterless holder, and it is clear that other benefits are derived from a better service to the consumer and less costs in meter renewal, clearing services, and distribution repairs.

When we consider the advantages the writer of the paper attributes to his dry storage, when a considerable proportion of his gas is still stored over water-filled tanks, greater benefits would accrue if the entire storage comprised gasholders of the waterless type.

In many instances to-day the inner lift of spiral or framed gasholders is being weighted to ensure a good pressure, and many years ago we constructed a gasholder on the East Coast to give a pressure of 14 in. In this case the engineer found it such an advantage that immediately the evening demand for gas arrived it was placed in service, and practically emptied before the other storage vessels were called upon. After this it was filled during the succeeding day so as to be ready for service again the following night, which is a practical demonstration showing the advantages derived from a gasholder giving a good pressure.

I regret circumstances did not permit me to ask the reader of the paper whether he made similar use of the waterless gasholder at Ipswich, for if so it seems to me that during a considerable period of the year he will be in a position to supply the whole of the gas required during the 24 hours from his waterless holder. He suggests, to my mind, that such may be the case, for he clearly shows the advantages derived from his new storage upon the distribution side.




**Seal Support for "M.A.N." Waterless Gasholders.**

I very much appreciate the opportunity given by the President to express my views upon the paper, and I congratulate the writer on the service he has rendered our industry in the enterprise he has shown, and for giving us the benefit of his valued experience.

### MR. STEWART'S PAPER ON COKE OVENS.

Mr. E. G. STEWART, in a written communication, states: In extending my reply to the very interesting and comprehensive discussion upon my paper it seems most convenient in the first place to clear up the points raised concerning the comparisons made in Tables IV., V., and VI. In these, working data and financial cost of the most economical coke ovens possible for gas-works were set alongside the similar data and costs of those very familiar gas-works carbonizing plants, the horizontal and continuous vertical retorts. Lack of space and a desire to avoid complication dictated the exclusion of an out-of-date system, the inclined retort, also of plants generally unfamiliar in this country at the present time, such as the small coke oven and the intermittent vertical. In the case of the latter two types of plant, the excellent paper read before the Institution a few years ago by Mr. G. M. Gill already provides a wealth of information. As far as possible these comparisons were placed upon an even basis. The largest gas-works units were taken for comparison of which I had personal acquaintance. The rates of pay for the coke ovens are those for similar gas-works operations. The working results are normal as distinct

from test operation, and the basic prices of coal and residuals are the same in all cases. To have done otherwise might have resulted in a charge of unduly favouring one or other system. This point appears to be appreciated by Mr. Clegg, and, as all data are given, a revision of prices can be made by anyone interested.

In a somewhat different category is the criticism of Col. Carr regarding the fuel requirements of horizontal retorts. I regret that I cannot agree with him that a fuel figure of 3 cwt. per ton for horizontal retorts is "disgracefully bad." It is not, perhaps, the best possible figure, but it is quite the usual one with Durham coal. Too often one sees such fuel figures published which having been obtained by difference between the yield of coke and the quantity available for sale represent the true fuel figure reduced by the moisture in the coke sold, the latter amounting to ½ cwt. or more per ton of coal.

As Mr. Sensicle has presumed, the respective plants were compared on the basis of their "natural" calorific value of gas made—*i.e.*, 510 B.Th.U. for continuous vertical retorts and 550 B.Th.U. in the case of horizontal and coke ovens. I do not agree that this vitiates the cost per therm comparison, as the vertical system has had to sustain a loss of coke and steam to balance the gas yield, and no extra capital or labour costs are incurred in the dilution. A similar consideration applies to the cooling of hot coke from horizontals and coke ovens. In the case of these plants it is true that, by incurring extra capital and labour costs, useful heat in the form of steam amounting to 200 B.Th.U. per ton of coal can be recovered from the hot coke. In the continuous vertical system this heat recovery is inherent in the design of the plant and is rightly credited thereto. Here again complication and confusion without corresponding gain would have resulted from an attempt to calculate costs on the basis of a uniform gas calorific value or of a uniform end temperature of the coke. The gas industry is able to regulate its declared calorific value to suit the type of plant adopted.

### Intermittent Systems.

The value of intermittent vertical retorts and of the small coke oven to the gas industry, stressed by Mr. Gill and Mr. Sensicle, is really outside the scope of the paper and will be worthy of further consideration when experience with the several intermittent systems now being put to work has been gained. In common with the horizontal retort and the coke oven, the charges are static, and hence the use of small coal and the incorporation of true blending are possible. The coke produced is of a density midway between the horizontal and coke oven. Much of the success of these plants will depend upon the demand for such a coke. Mr. Gill has no doubt of its suitability, and it is of a nature favoured in certain parts of the Continent, while Col. Carr evidently has a local market for this type of coke. This factor of local requirements in coke properties is of great importance. In this country, at present, the lighter varieties of coke produced from the continuous vertical retort are the most favoured by the domestic user. Mr. Copp's reference to Continental requirements of a light coke appear to relate to Norway and Denmark, and other conditions than those of use are the controlling factor in this case. This disparity in requirements accounts for the anomalous experiences expressed by the various speakers.

Sir Arthur Duckham can use oven coke and can purchase it at a rate cheaper than gas coke although 150 miles from a coke oven. Mr. Clegg, on the other hand, can easily sell all his make of gas coke in an area surrounded by ovens, while Mr. Copp and the President point to the quantity of coke converted by the gas industry to water gas, or else exported, which indirectly benefits the ovens. My own view, which is not quite in line with Mr. Sensicle's, is that oven coke has secured its present position principally on account of the lower price at which it has been offered. In the Institution Number of the "Gas World" I am credited with extolling oven coke; this is a complete misunderstanding. Rather did I try to point a moral which I may repeat by introducing an abstract from a private criticism of my paper I have been favoured with from a friend prominent in the coking industry. He says: "Loss of markets following the war caused coke ovens to look for other markets to keep their plants going. One or two with specially favoured coals found the gas coke market was good. Many who have not specially favoured coals, but could sell at a low price, also found the gas coke market good. Some of us pointed out that if this market was to be maintained and established the right article must be produced. That has led to individual and collective research upon the production of household coke." In these days research often produces results in a comparatively short time. It is of the greatest importance, therefore, that the gas industry should devote similar intensive attention to the quality of its coke yield so as to ensure that the present suitability to the requirements of its clients will be maintained. Sir Arthur Duckham said that after all we were a gas industry to make gas at the cheapest price and not primarily coke manufacturers. I submit, nevertheless, that we are still gas and coke companies, and that an assured sale of coke at good prices is a necessity for cheap gas production.

Sir Arthur Duckham also drew attention to the use by the coking industry of suitable and clean coal. Often this is in the form of washed smalls which are at present low in price because the demand is small. It must not be assumed that this low price is synonymous with low grade; it is a fact that the coal used by the coking industry is nearly always high-grade from the coke point of view at least. Col. Carr, having horizontal retorts, is able to use washed smalls with profit and benefit, but continuous vertical retorts must have a larger coal which is not so simple to blend or to clean, and therefore needs more care for good coke quality production.

### Need for Legislation.

The President, Col. Carr, and Mr. Clegg introduced pertinent questions relating to the purchase of coke oven gas, a subject in itself. The matters of marginal costs of gas production and marginal values of coke yields were rightly brought forward as being of importance. As I pointed out, linked with these marginal costs is the question of summer and other off-peak gas loads and consequent saving in maintenance costs of carbonizing benches mentioned by Sir Arthur Duckham; and going further one comes to the question of revision of methods of charge for which legislation is so urgently needed by the industry.

The President rightly drew attention to the necessity for this legislation, as well as to regulated coke marketing, and to the importance of giving consideration to the future as well as to the present and immediate future positions before entering into agreements to purchase oven gas. I can only endorse these important observations.

I am much indebted to Dr. E. W. Smith for his outline of the Area Gas Committee's report which is so valuable a supplement to my paper, and I am pleased to have his support of my view that gas networks should be managed by the gas industry.

Finally, I should like to express my gratitude for the manner the paper was received and discussed, and I trust the various aspects of gas economics and politics considered will continue to receive the earnest attention of members of the industry.

# Parliamentary Intelligence.

**[From Our Special Correspondents.]**

## House of Lords.

### Private Bills.

The Ascot District Gas and Electricity Bill has been read a third time and sent to the House of Commons.

### Special Orders.

The following Gas Orders have been approved: Swaffham, Woking District, Redcar, and the Wandsworth, Wimbledon, and Epsom District.

The Exmouth (No. 2) Gas Orders have been laid before the House and referred to the Special Orders Committee.

## House of Commons.

### Special Orders.

The following Special Orders have been approved: Swaffham, Woking District, and Redcar. Plans have been deposited in connection with the Stoke-on-Trent Corporation Gas Order.

### Sale of Coke.

The Middlesex County Council Bill came before the local Legislation Committee of the House of Commons. Clauses 34 to 38 of the Bill imposed penalties upon the fraudulent sale of coke which is either short in weight or has had its weight artificially increased by damping. The provisions also apply to any solid fuel derived from coal. Giving evidence in support of the proposal, the representative of the County Council stated that cases had been reported to them in which deficiencies in weight had occurred to the extent of 69 lbs. on 2 cwt., 98 lbs. on 5 cwt., 104 lbs. on the half-ton, and 276 lbs. on a ton. The Committee passed the Clauses without further discussion.

# Legal Intelligence.

## Pontardulais Gas Company.

### Tenders to be Advertised For.

In the Chancery Division on Wednesday, June 4, Mr. Justice Eve had again before him the petition for the winding-up of the Pontardulais Gas Company, Ltd.

It was stated that the matter had stood over for a time in order that the unsecured creditors might have a meeting. Offers of £3500 and £3750 had been considered, but the creditors thought that the undertaking was worth more. So resolutions were passed that the undertaking should be advertised for sale in the "Gas Journal" and other newspapers. If an offer was received and accepted the debenture-holders could be satisfied and a balance would be left for the creditors.

His Lordship directed that the matter should stand for six weeks so that the undertaking might be advertised for sale and tenders asked for and considered.

# Register of Patents.

## Quartz Deflectors for Gas Mantles.—No. 304,778.

SOCIETE DE GAZ ET D'ELECTRICITE DU SUD-EST., of Lyons.

No. 2442; Jan. 24, 1929. Convention date, Jan. 27, 1928.

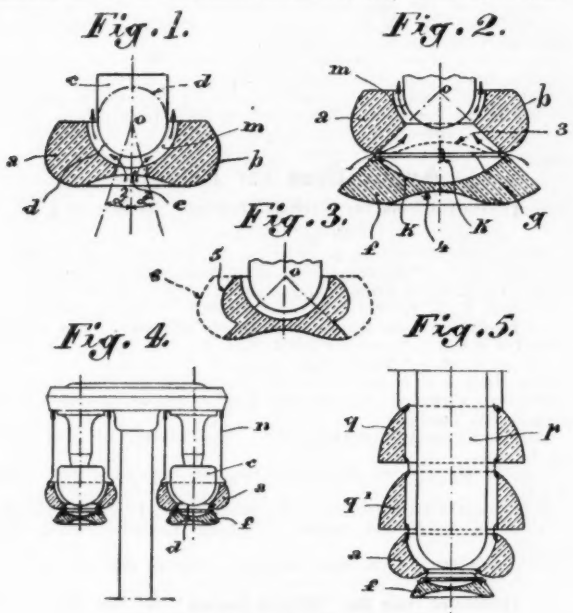
This invention relates to a lens for deflecting laterally some of the rays of light from an inverted gas mantle, in order to obtain a greater area of satisfactory illumination on a horizontal surface.

The invention comprises a block of transparent quartz or silica glass having a semi-spherical internal surface concentric with the end of the inverted mantle and of a diameter slightly greater than the diameter of the mantle, and an external surface ground to the particular curve shown in the accompanying drawings. The block has the further advantage of being very little in the way, and is readily placed about the mantle in a zone where the temperature is between 700° and 800° C. This block of ground quartz is formed with a circular opening in its lower face allowing for the passage of the secondary air necessary for burning the gas.

The invention also comprises a second block disposed below the first to deflect downwardly directed rays passing through the lower circular opening in the first block.

Fig. 1 shows a section through the quartz block *a*; fig. 2 a section through the two quartz blocks *a* and *f*; fig. 3 a section showing a modification of the quartz block *a*; fig. 4 an elevation of a lamp standard showing the invention applied thereto; and fig. 5 a section of modification applied to long mantles.

The light-rays radiating from a bare mantle are transformed or deflected into a more horizontal direction by passing through a quartz




**Quartz Deflectors for Gas Mantles.**

block *a* formed with an internal surface of semi-spherical shape and an external surface of the convex form shown at *b*. The rays of light passing through the quartz block *a* will thus be deflected to give a greater area of satisfactory illumination either from a single inverted mantle or from a group of inverted mantles.

The inverted mantles are in the form of a cylinder *c* ending in a semi-sphere *d*. The height of the cylinder is very small, and the surface which emits most of the luminous rays is the semi-sphere having a centre at O. It is necessary, however, to supply at the bottom of the mantle *c* sufficient air to support combustion; and for this purpose two solutions are possible.

1. A circular aperture *e* (fig. 1) is provided in the lower part of the block *a*, the supply of air entering through this hole and the burnt gas escaping past the upper part of the block. However, this arrangement cannot be employed in all cases, as the aperture *e* allows generally a great number of luminous rays to pass without deflecting those in the angle $a^2$. It follows that the rays at this point not being deflected, a too bright circle is obtained at the foot of the luminous source. The solution can only therefore be accepted in the case where it is desired to intensify the illumination at the foot of the gas lamp.

2. The construction shown in fig. 2 allows for the introduction of secondary air, and does not change the shape of the intensity curve. The block is formed in two parts *a* and *f*, separated for a sufficient space to form a circular annular opening *g* through which secondary air enters. The curves 3 and 4 are parallel. The block *f* is supported from the block *a* by ferro-nickel staples *k* entering small holes drilled in the quartz.

The sizes of mantles for a multi-group are very small, and the space *m* which must be left between the mantle and the refractory block to ensure the passage of the burnt gases is only a few millimetres. As the quartz block is only itself very thin it will be understood that the principal advantage of this arrangement is the small amount of room it occupies.

The refractory block *a* is suspended (fig. 4) from the bracket by ferro-nickel rods *n* provided at the top with a system of regulation for centring the block with the mantle. The cleaning of the block or its withdrawal for the replacement of a mantle is extremely simple, since the rods *n* only require taking down. In order to avoid too great a thickness of the block it may be lessened by removing a part of the exterior surface as shown in fig. 3. The aperture *e* is not shown in fig. 3. The curves 5 and 6 are parallel. To avoid dazzling in certain cases it may be necessary to roughen the outer face of the block.

In the case where the illumination is done by gas under pressure with the employment of very long mantles *p*, the cylindrical incandescent surface may be surrounded itself by one or more quartz rings *q*, *q*¹. The rings are simply placed above the block *a* and suspended in a similar manner to the block itself, the necessary spaces being left for the entry of cold secondary air and the escape of burnt gas (fig. 5).

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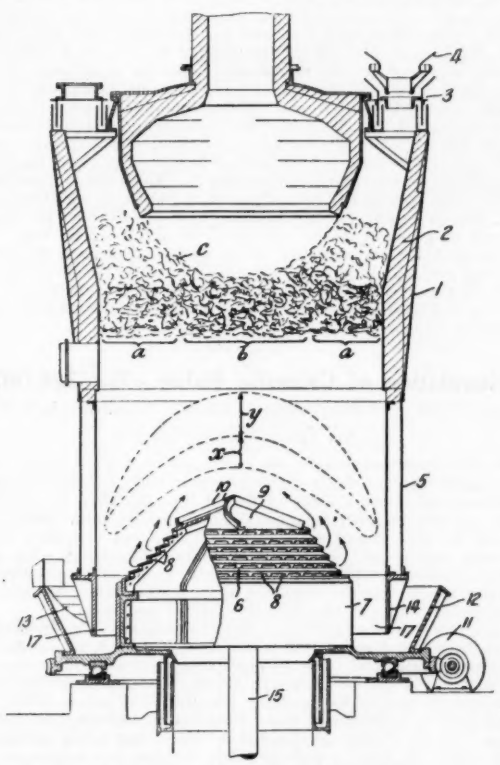
## Gas Generators.—No. 312,162.

HUMPHREYS & GLASGOW, LTD., of 38, Victoria Street, S.W. 1 (Assignees of HAUG, J. S., of Philadelphia).

No. 15,037; May 14, 1929. Convention date, May 21, 1928.

Fig. 1 is a diagrammatic view, principally in central section, of a gas generator or gas producer embodying the invention. The producer shell 1 is shown as provided with a refractory lining 2. A rim feed charging mechanism happens to be selected from other mechanisms adapted to produce the described distribution of finer particles at the periphery of the fuel bed as indicated at *a* and coarser particles at the centre as indicated at *b*. The rim feed mechanism is shown at 3, and it includes a charging hopper 4 rotating about




**Humphreys & Glasgow Gas Generator.**

the periphery of the producer top and feeding fuel to the entire periphery of the fuel bed. The top of the fuel bed is indicated at *e*. The lower part of the producer is provided with a water jacket 5. The grate is generally indicated at 6, and it is of the mechanical variety. As shown, the grate consists of a cylinder 7 surmounted by a truncated stepped cone which is provided with ports 8.

Above the truncated cone there is provided a flattened top 9 which is equipped with curved cutting blades 10. The flattened top is imperforate, or, otherwise stated, has no ports. The grate is rotated by the worm and worm wheel mechanism 11; 12 is the ash pan and 13 is a plough; 14 indicates means for sealing the grate.

Air or steam or mixed air and steam admitted to the interior of the grate through the conduit 15 flows into the fuel bed through the ports 8 and is delivered directly to an annular zone of the fuel bed extending from the periphery inward and comprising the finer particles. No air or steam passes through the top of the grate, but owing to the greater porosity of the fuel bed in the centre sufficient air finds its way up through that section as indicated by the arrows. Thus the height of the combustion zone indicated at *x* and also of the reduction zone indicated at *y* in the centre of the fuel bed is maintained comparatively near the grate or at a low level. This is further aided by the blades 10 which increase the rate of ash removal from the centre of the fire and help to equalize the rate

of combustion and the rate of ash extraction in the centre part of the fuel bed.

The result of the co-action of feeding relatively coarse fuel in the centre and fine fuel to the rim and of the annular admission of gas making fluid with the flattened imperforate top of the grate and the means thereon for ash extraction in the centre of the fire, is illustrated by the position and shape of the combustion and reduction zones in fig. 1. These zones extend uniformly across the entire fuel bed, and the combustion zone in the centre is quite close to the grate, giving an effective fuel bed depth and avoiding the formation of blow holes. The activity at the outer annulus of the fuel bed is ensured, and there is a consequent reduction in the quantity of unburnt fuel escaping from this portion.

## Charging Horizontal Retorts.—No. 327,962.

JUDD, G. H., of Sheringham.

No. 1001; Jan. 11, 1929.

According to this invention, retort mouthpieces are provided with a valve, preferably fixed on the lid or door of the mouthpiece, but which may be fixed on the mouthpiece. On the upper side of the valve is a spigot piece or connector. A movable hopper is supported above the retort on a suitable carriage when the retort is about to be charged, the hopper having a valve at its lower extremity with a spigot piece or connector attached similar to the connector on the lid valve. Between the two spigots or connectors is fixed a chamber or tube (say) of asbestos cloth or any material unaffected by heat, and as impervious as possible, to form a connection between the valve on mouthpiece and the valve on hopper. Each end of the chamber or tube will be fastened by couplings or suitable connections to make fairly gas-tight joints.

A pushplate with short connecting rod is rested inside each mouthpiece, with its connecting rod passing through a packing box or gland attached to the mouthpiece lid. The pushplate may be swung in or out of the mouthpiece when the lid is closed or opened, and left in the mouthpiece during carbonization when the lid is closed. A long rod is attached to the end of a short connecting rod for propelling the pushplate with coal and withdrawing as far as the inside of the lid mouthpiece, through the packing box attached to the lid.

When a charge of coal is carbonized the lid is opened, the coke is withdrawn, the lid is then closed with its pushplate attached through the packing box, and tightened up. The hopper with the charge is moved into position, with its tube or chamber attached; and the lower end of the latter then connected to the valve on the mouthpiece. The valve on the hopper is opened to allow the coal to fall into the chamber, and is then closed. The valve on the mouthpiece is then opened to allow the coal to fall in front of the pushplate, and is again closed. A poker may be provided for starting the coal to gravitate to the inside of the retort. The long rod is then connected to the short rod of the pushplate through the packing box, and the coal is pushed to its position for carbonization. The process is repeated until sufficient coal is passed into the retort, when the long rod is disconnected, and, if necessary, the packing box is plugged or capped.

## Regulation of Calorific Value.—No. 328,007.

CROFT, C. M., and BUXTON, R. H., both of Wandsworth, S.W. 18.

No. 1420; Jan. 15, 1929.

This invention consists in the combination of a recording calorimeter, preferably of the continuous type, with suitable means for regulating the calorific value of the coal gas so that the regulation is effected automatically to maintain the calorific value substantially constant at the desired standard. To allow of operation by the recording calorimeter, the regulating means embodies a relay device or servo-motor providing the necessary power for adjusting the governor which actually regulates the calorific value, for example, by means of a suction throttle valve on the foul main.

A primary relay device is employed consisting of a pivoted jet-pipe connected by a spring link to the recording needle of a differential expansion calorimeter. The jet-pipe is supplied with oil under pressure and directs the jet against a distributor comprising two orifices leading to the ends of an auxiliary cylinder. The piston of the latter is connected to a secondary relay device also consisting of a pivoted jet-pipe, the movement transmitted by the piston being conveyed to a link which displaces a slide or roller between two converging surfaces. One surface is formed by, or connected to, the jet-pipe of the secondary relay, while the other surface is provided by an inclined plate or wedge at one side of the jet-pipe. An adjusting spring presses against the back of the wedge plate, and the jet-pipe is connected to the centre of a flexible diaphragm or governor, the underface of which is in communication with the gas main leading from the retorts.

A butterfly valve or throttle arranged in the continuation of this gas main towards the exhauster is operated by the piston of a secondary cylinder, the two ends of which are supplied from the respective orifices of the distributor of the secondary relay.

In operation, when the calorific value of the gas varies from normal, the needle of the recording calorimeter moves to one side or the other, thereby displacing the oil nozzle of the primary relay in one direction or the other. The impulse thus delivered moves the piston in the auxiliary cylinder, causing the slide to vary the spring tension or load of the main governor. Thus the variation of the calorific value has altered the setting of the governor, which, by means of the secondary relay and the cylinder controlled thereby, will adjust the butterfly valve to regulate the pull on the retorts in accordance with the ascertained calorific value of the gas until the latter is restored to the normal, whereupon both relays return to their neutral positions leaving the pistons of their respective cylinders in the new positions until the next variation of the calorific value occurs.

## Water-Cooled Condensers.—No. 328,421.

HENSHAW, D. M., and W. C. HOLMES & CO., LTD., both of Huddersfield.

No. 11,396; April 12, 1929.

This invention relates to condensers of the kind in which the condensing chamber proper is arranged above and in communication with the chamber to which the condensate is delivered.

Experience with apparatus of the kind above referred to, state the patentees, has shown that it is not advisable to cool the tar which has been separated from the gas and which accumulates in the base of the apparatus, as this involves an unnecessary consumption of water or alternatively a reduction in the degree of cooling of the aqueous condensate or ammoniacal liquor which is secured with a given rate of supply of water at a given temperature.

According to the present invention the chamber to which the condensate is delivered is divided into two sections, one designed to accommodate mainly or solely the condensed tar, while the other is designed to accommodate and function as a cooler for the aqueous condensate.

The condenser chamber proper is separated from the chamber adapted to receive the aqueous condensate and also from the chamber adapted to accommodate the tar, by means adapted to reduce transference of heat to the body of aqueous condensate from the tar collected and from the gas passing through the condenser proper. The base of the condenser may be divided vertically into two chambers into one of which extends a pipe delivering the condensate from the condenser; a trapped outlet from the base of this chamber for the tar collecting therein; an overflow at a higher level for the aqueous condensate; means for delivering the aqueous condensate into the second of the chambers provided at the base of the condenser; means associated with the second chamber adapted to effect the cooling of the aqueous condensate delivered thereto; and a trapped outlet for the aqueous condensate extending from a point adjacent to the base of the chamber.

The bottom of the condenser chamber and the division between the two chambers in the base is constructed so as to act as a heat insulator, and both of the chambers may be provided with means adapted to function as pressure equalizing devices between the chambers and the condenser chamber proper.

## Applications for Patents.

**[Extracted from the "Official Journal" for May 14.]**

Nos. 13,710—14,499.

CHRISTENSEN, R.—"Safety device for gas burners." No. 13,863.
DAVIES, A. I.—"Operating coke oven plant." No. 14,025.
FORSTER, J. D.—"Coin-freed gas meters." No. 14,326.
FUSSELL, E. J. K.—"Coin-freed apparatus." No. 14,310.
GAS LIGHT AND COKE COMPANY.—"Depth indicators." No. 14,056.
GLOVER & CO., LTD.—See Fussell, E. J. K. No. 14,310.
GRIGGS, A. R.—"Manufacture of gas." No. 13,909.
HUMPHREYS & GLASGOW, LTD.—See Griggs, A. R. No. 13,909.
IMPERIAL CHEMICAL INDUSTRIES, LTD.—"Operating coke oven plant." No. 14,025.
IMPERIAL CHEMICAL INDUSTRIES, LTD.—"Production of water gas." No. 14,303.
MACGREGOR, T.—See Imperial Chemical Industries, Ltd. No. 14,303.
METROPOLITAN GAS METERS, LTD.—See Forster, J. D. No. 14,326.
THURLOW, H. J.—See Imperial Chemical Industries, Ltd. No. 14,025.
WILKINSON, H.—"Gas main stoppers." No. 14,365.

**[Extracted from the "Official Journal" for May 21.]**

Nos. 14,500—15,260.

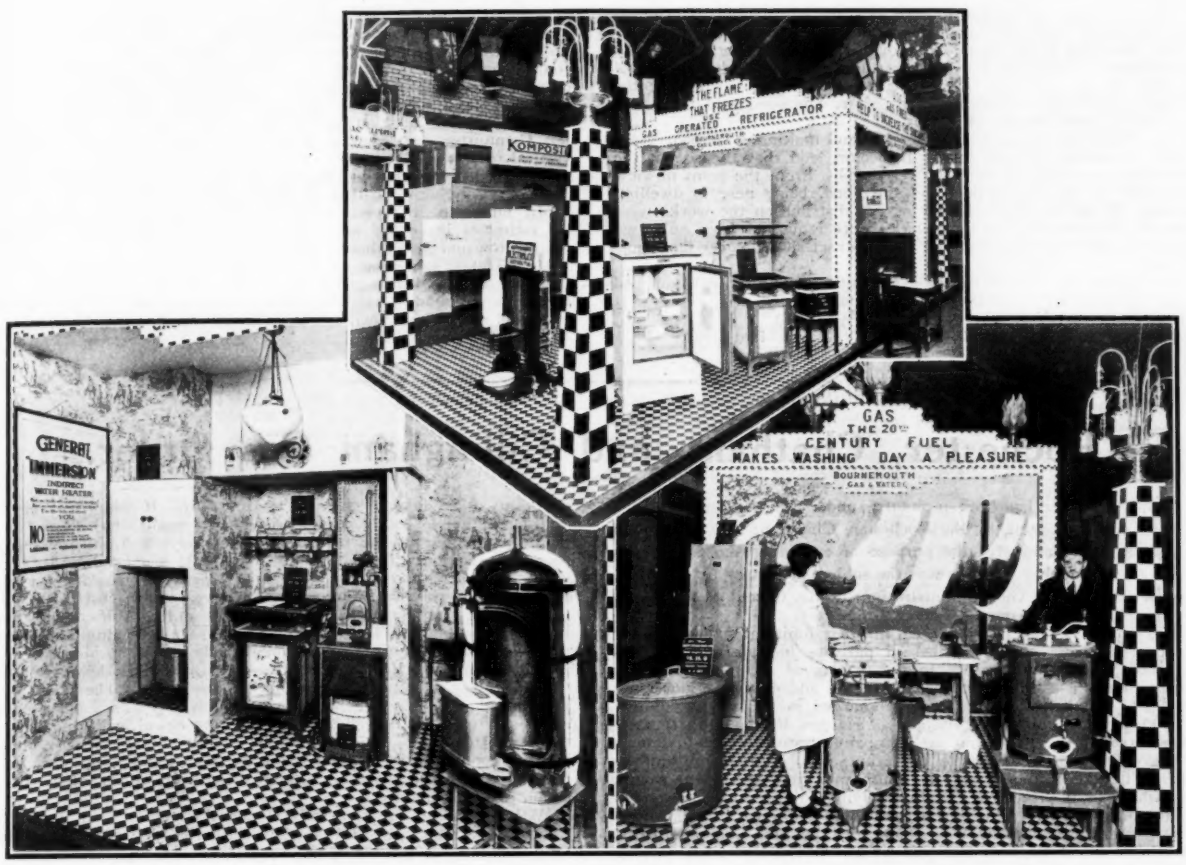
ANDREW, T.—"Gas cleaning apparatus." No. 15,249.
BARNSLEY, W.—"Lighting attachment for gas burners." No. 14,676.
BURT, LTD., A. & T.—"Gas water heater systems." No. 14,611.
BURTON, M. B.—See Barnsley, W. No. 14,676.
FORSHAW, A.—"Radiants for gas fires." No. 14,892.
GOLDEREN, F. M. VAN.—See Forshaw, A. No. 14,892.
HORSTMANN, F. O. and J. H. G. (HORSTMANN GEAR COMPANY, LTD.).—"Clockwork gas controllers." No. 14,515.
HORSTMANN, F. O. and J. H. G. (HORSTMANN GEAR COMPANY, LTD.).—"Remote control of gas burners." No. 14,516.
MAIN, LTD., R. & A.—See Forshaw, A. No. 14,892.
POOLE, D. C. E.—"Gas meters." No. 14,648.
SHEPHERD, T.—"Gas fires." No. 14,654.
SOUTH METROPOLITAN GAS COMPANY.—"Bituminous surfacing material." No. 15,233.
WELLS, J.—See Barnsley, W. No. 14,676.
WILSON, J. H. (WILSON GAS METERS, LTD., G.).—See Poole, D. C. E. No. 14,648.

**[Extracted from the "Official Journal" for May 28.]**

Nos. 15,261—16,082.

BEIMANN, W.—"Washing gases produced in carbonization chambers." No. 15,773.
CHATWIN, J. (THYSSEN'SCHE GAS- UND WASSERWERKE GES.).—"Gas purifier." No. 15,750.
EWART, S. (EWART & SON, LTD.).—"Gas geysers." No. 16,072.
JOHNSON, J. Y. (I. G. FARBENINDUSTRIE AKT.-GES.).—"Apparatus for manufacture of low-temperature carbonization tar." No. 15,327.
POOLE, D. C. E.—"Gas meters." Nos. 15,725, 15,726.
RADIATION LTD.—"Gas grates." No. 16,061.
SMITH, C. N.—"Screen for coal, coke, &c." No. 15,412.
WILSON, J. H. (WILSON GAS METERS, LTD., G.).—See Poole, D. C. E. Nos. 15,725, 15,726.
YATES, H. J.—See Radiation Ltd. No. 16,061.

# A Bright Display at Bournemouth.




Our photographs are of the Bournemouth Gas and Water Company's Exhibit at the Ideal Homes Exhibition, held in Bournemouth from May 8 to 17. The Gas Section at this Exhibition proved very popular. The stand was divided into four sections, the general colour scheme being black and white. At each of the four corners there was an obelisk surmounted by a 9-light Bray chromium-plated fitting. The centre of the stand was partitioned-off to form the four separate sections, and above these partitions were fixed the facia boards, showing appropriate slogans, each facia being surmounted by a 4-light "Torchere" with "Flambeau" shade. The whole of the lighting was distant controlled. At one end of the stand the whole range of "Electrolux" gas-operated refrigerators was on view. All were in operation. One half of the centre section was devoted to a tastefully decorated lounge; while in the other half of this section was shown an all-gas kitchen, featuring the General Gas Appliances Company's new willow-pattern gas cooker with oven heat-control, fixed in a tiled recess. In an airing cupboard on the left of the recess was fitted the latest low-consumption "Immersion" indirect water heater. The whole of this apparatus was in operation. The other section of the stand was given over to a washing demonstration; the latest type of gas-heated washing machine being demonstrated in use. The exhibit created a great amount of interest; many orders were booked on the spot, and there are several hundred inquiries to be followed up.

# Ministry of Health Inquiry at Barrow.

At the Barrow Town Hall, on Tuesday, June 3, Mr. F. GREGSON WILLIAMS, M.Inst.C.E., one of the Inspectors of the Ministry of Health, held an inquiry into the application of the Barrow Town Council for sanction to borrow £47,100 for certain works in connection with the proposed centralization of their gas-works at Salthouse. Alderman C. G. B. Ellison and other members of the Town Council were present, together with the Town Clerk, Borough Treasurer, Borough Surveyor, Gas and Water Works Manager (Mr. C. Diamond), and the Assistant Manager (Mr. W. Gabbott), representatives of Messrs. Drakes, Ltd., Halifax, and Mr. A. Barrie, a former member of the Barrow Town Council, who did not oppose but desired to offer a criticism of the scheme.

The TOWN CLERK gave the statistics relating to the Borough, and explained that the scheme of centralization of the gas-works of the town had been approved by the Town Council.

Mr. CLAUDE DIAMOND, the Engineer and Manager of the gas and water undertaking for the past seven years, stated that at present there were two gas-works belonging to the Corporation—one at Hindpool Road and the other at Salthouse—these being one and a quarter miles apart. He then gave the respective capacities and details of the works.

The maximum daily output of gas during the past 12 months was 1,529,000 c.ft. on Feb. 4, 1930. The declared calorific value of the gas was 475 B.Th.U. The total quantity of gas made during the 12 months ended March 31, 1930, was 420,344,000 c.ft., as compared with 388,921,000 c.ft. for the previous year—an increase of 31,423,000 c.ft., equal to 8·1 p.ct. Messrs. Vickers Armstrong's consumption for the same period was 33,349,000 c.ft., an increase of 2,108,000 c.ft., or 6·7 p.ct.

The reason for the proposed centralization scheme was that the existing coal gas manufacturing plant—that was the retort settings, coal handling plant, and retort house—at the Hindpool Road Works was in such a condition as to be beyond economic repair, and it had become absolutely imperative to provide new manufacturing plant. Having regard to the fact that it was not an economic proposition for an undertaking of the size of Barrow to have two works for the purpose of manufacturing gas, involving as it did considerable duplication in the way of maintenance, fuel, personnel, &c., it was thought to be an opportune time to centralize the manufacturing plant at Salthouse.

Very careful consideration was given to the type of plant to be installed, and after visiting the works of eleven different undertakings and inspecting the various plants in operation at such works, it was decided to recommend the adoption of the horizontal type of carbonizing plant, and, ultimately, the present scheme was evolved. After seeing the various works, tenders were invited for horizontal plants, and after due consideration it was decided, subject to the sanction of the Ministry of Health, to place the contract with Messrs. Drakes, Ltd., of Halifax, the amount being £40,629.

The plant to be provided was as follows: A steel framed retort house, complete with horizontal carbonizing plant of a nominal capacity of 2 million c.ft. per day, consisting of 10 beds of retorts, eight of which were to be filled with 10 retorts each, 24 in. by 18 in. by 23 ft. long, the remaining two to be left empty; stoking machine, and coal and coke handling plant complete. The coal-handling plant

would be of the usual elevator and overhead conveyor type, and the coke-handling would be dealt with by an electrically-driven coke bus on a circular track in the yard, which gave a storage of 1500 tons. Provision was made for lighting, heating, water, steam, electricity supplies, and drainage to the retort house and plant, alteration of railway sidings, and connections to existing gas mains. The existing workshop would be taken down and re-erected in another position. Boosting plant would be provided for conveying gas to the gasholders at Hindpool Road Works, and an 8-in. steel main would be laid for the purpose. New offices would be provided after the completion of the carbonizing plant. Mr. Diamond said there was a total estimated saving of £3905.

The INSPECTOR suggested adding £5 and making it £4000.

Mr. DIAMOND, in reply to the Inspector, said that the site of the Hindpool Road Works was very restricted. From the point of view of health he did not consider the site good, being near to dwelling houses. From the point of view of gas distribution the works were central. Tenders for the new works were requested from only two firms because it was desired that one contract should cover the whole work.

The INSPECTOR asked if by the expenditure of £47,000 it was hoped to save £4000 a year on the whole gas undertaking.

Mr. DIAMOND: Yes.

The INSPECTOR: What has Mr. Barrie to say to that?

Mr. BARRIE: It will be the first time they have saved anything. (Laughter.)

Councillor HOLLAND (Chairman of the Gas and Water Committee), in answer to the Inspector's questions, said the reason why the Gas Committee confined the tendering for the new works to two firms was because, after a deputation had visited various places and seen various plants in operation—both vertical and horizontal—they had decided that horizontal was the most suitable, and as these firms could complete the job from A to Z they thought it would be more economical to give the whole job to one of them, and that it would be better than having half-a-dozen contractors on the work. In reply to another question by the Inspector, Councillor Holland said the Committee decided that horizontal retorts were preferable to vertical retorts at Barrow.

Mr. BARRIE pointed out that shunting of wagon charges would be heavier at Salthouse than at Hindpool Road Works.

Mr. DIAMOND, in reply, pointed out that that was provided for in his estimates in regard to costs. The cost at Hindpool Road was 5d. per ton and at Salthouse 10d. per ton.

Mr. BARRIE said that he had heard the proposal discussed by practical men, and they had impressed him at any rate that the most had not been made of the Hindpool Road site, and on their behalf he would have liked expert advice before going further.

The inquiry then closed.

# Rochester, Chatham, and Gillingham Gas Order.

A Special Order has been promoted, under the Gas Undertakings Acts of 1920 and 1929, by the Rochester, Chatham, and Gillingham Gas Company mainly for the purpose of extending the Company's limits of gas supply; and this was the subject of inquiry by Mr. J. F. RONCA (Director of Gas Administration) at the Offices of the Board of Trade at Westminster on Friday, June 13.

The Company seek to include within their limits of supply a fairly large area comprising a number of parishes in the rural districts of Hoo, Milton, and Strood, in the County of Kent, and ask for power to make a differential charge in the added area of not more than 2d. per therm above the price charged in the existing limits. The Order also contains a number of clauses dealing with finance, administration, &c., to bring the Company's legislation up-to-date.

There was no opposition to the proposals of the Order, but the Port of London Authority and the Southern Railway Company sought to include in it protective clauses applying to the added area, and containing provisions which go beyond those contained in the general law. The Gas Company was represented by Mr. JACQUES ABADY, and the Southern Railway Company by Mr. RALPH BURY.

Mr. ABADY said that the Company had been a statutory undertaking in their existing incorporated form since their Act of 1887, and since that time neither the Port of London Authority nor the Southern Railway Company or its predecessors had had the benefit of any such protective clauses as they now sought. Both the River Thames and the Railway Company's lines passed through the Gas Company's existing area and the proposed added area, and Counsel emphasized that no difficulty or friction had arisen as between the Railway Company or its predecessors and the Gas Company.

The Port of London Authority raised the point that by the Order the Gas Company sought to include within its area of supply certain parts of the bed and shore of the River Thames, and the Authority asked for the insertion of a clause to the effect that the Company were not authorized to interfere with the bed, soil, banks, or shores of the river or the navigation thereof within the limits of the Port of London, or with any property of the Authority, or affect in any manner the rights, powers, and privileges of the Authority.

The case for the Railway Company was that the provisions of the Gas-Works (Clauses) Acts, 1847 and 1871, which were incorporated in the Order, did not afford adequate protection; but Counsel commented that no explanation was given as to why the Clauses Acts did not afford adequate protection. The Railway Company had submitted a long clause, which, if inserted, would apply only to the added area, so that if the Board of Trade inserted it the enactments relating to the added limits would be different from those applying to the existing limits.

Mr. BURY suggested that that difficulty could be overcome by applying the clause to the whole of the area.

Mr. ABADY retorted that Mr. Bury knew perfectly well that if he proposed to make the clause retrospective he would not have a leg to stand on.

The clause submitted by the Railway Company provided that the Gas Company, in laying or renewing pipes, mains, culverts, or other works on railway property should (except in cases of emergency) execute such works in accordance with plans and sections previously submitted to, and reasonably approved by, the Principal Engineer of the Railway Company, and to the reasonable satisfaction of the Engineer. If the Engineer did not express his approval or disapproval of the plans and sections within twenty-one days after they had been submitted to him, he should be deemed to have approved. (The general law does not provide for the submission of sections with the plans, and it provides for three days' notice instead of twenty-one days.) The clause also provided for the restoration by the Gas Company of the roads over bridges, level crossings, and approaches maintained by the Railway Company which might be interfered with as the result of the Gas Company's operations, and the works must be carried out so as not to cause injury to the Railway Company's property or interference with traffic. The clause also sought to empower the Railway Company to execute such work (other than the actual laying and maintenance of the pipes) in the case of any level crossing, if it so elected, and to recover the reasonable costs of so doing from the Gas Company. If injury to property or interruption to traffic should arise as the result of the Gas Company's operations or the failure of pipes, the Gas Company should pay compensation. The Gas Company should also pay the Railway Company the reasonable expenses of the superintendence of the works carried out by the Gas Company and the reasonable costs of watching, lighting, and protecting the railways during the carrying out of the works, but the superintendence of the Railway Engineer should not relieve the Gas Company from liability which would otherwise attach to them for accidents occasioned by the acts or defaults of the Gas Company's agents, contractors, or workmen. The Gas Company should also pay the Railway Company any additional expense reasonably incurred, in effecting any repair, renewal, widening, alteration, or extension of the railways, by reason of the existence of the Gas Company's apparatus on the railways. Finally, disputes were to be settled by an arbitrator appointed by the President of the Institution of Civil Engineers.

With regard to the proposals of the Port of London Authority, Counsel said it appeared that that Authority desired to place the Gas Company at its mercy, and the Company objected to that on principle. The Gas Company had certain obligations to fulfil, and in order to do so they had to open the streets in order to lay mains. In so far as the Company wished to lay pipes in any place within the jurisdiction of the Port of London Authority, which was covered by the definition of the word "street" in the Gas-Works (Clauses) Act of 1847, the Port of London Authority were protected, just as was anybody else who was responsible for the maintenance of a street, by the provisions of the Clauses Act; in so far as land within the jurisdiction of the Authority, but which was not a street, was concerned, then the Company had no rights to enter upon that land except to a limited extent authorized by a clause in the Company's 1906 Act, which gave the powers usually given to gas companies to lay pipes in streets or roads not dedicated to public use, and in that case also the Port of London Authority were entitled to the usual protection.

The terms of the clause proposed by the Port of London Authority did not even refer to the possibility of the Company laying mains on the banks or shores of the Thames with the consent of the Authority, for it did not give the Authority power to give consent.

Apart from the objections on principle, however, practical difficulties might conceivably arise if the clause asked for were inserted in the Order. For example, the proposed clause would prohibit the laying of mains in the banks or foreshores of the river. The word "bank" was not defined, but it was a very wide term. The Gas Company might wish to work along what were colloquially known as the "banks," or on roads running along or immediately adjoining the river, but these places might come within the term "bank" in the clause.

There was no reason in principle why the Company should be deprived of the position in which it would be placed by Parliament, nor could he conceive that the jurisdiction of the Port of London Authority would be lessened or weakened by the fact that the Company could continue to exercise in the added area of supply exactly the same powers as it had exercised since 1867 in the existing area.

With regard to the proposals of the Southern Railway Company, the same objections in principle held. The Railway Clauses (Consolidation) Act of 1845, which contained a bundle of clauses relating to gas and water pipes on railway property, was passed before the Gas-Works (Clauses) Act of 1847, and it must be assumed that if Parliament had thought fit, in 1847, to include any special particularity relating to railway companies it would have taken the necessary steps then. Parliament had not done that in 1847, neither had it done so in the Gas-Works (Clauses) Act of 1871, the Gas Regulation Act of 1920, or the Gas Undertakings Act of 1929. A result of the inclusion of the proposed clause would be to make the Gas Company, *vis-à-vis* the Railway Company, a trespasser, whereas the Act of 1845 recognized that the railways and the pipes had a right to be where they were, and if the Railway Company, for its own convenience, wished to alter the positions of the pipes it must do so in accordance with the terms of the 1845 Act.

With regard to level crossings, Counsel held that railway companies were in a highly privileged position in running their railways over the roads, and were in a sense trespassers on the public highways. If the proposed clause were granted, the Gas Company would be placed in a position of great embarrassment should it wish to make any alterations of the mains lawfully laid. There was no reason why, in respect of its added area, the Gas Company should be made the hand-maiden of either the Port of London Authority or the Railway Company.

Mr. *G. Ellson* (Chief Engineer to the Southern Railway), in evidence, said that in the area which the Gas Company proposed to add to their limits of supply there were roughly 14 miles of the Railway Company's track, 11 level crossings, and 7 bridges carrying roads over the railway. Owing to the development in the area, considerable electrification of the railways would be carried out, and the provisions of the Gas-Works (Clauses) Act, 1847, were completely out-of-date and totally inadequate to protect the railway undertaking with an electrified system. Again, the Act did not make provision against loss of traffic or possible loss of traffic owing to the Gas Company's operations. With regard to notice, section 8 of the 1847 Act provided for only three days' notice; that was quite insufficient to enable a railway engineer to look into any project such as might be put forward under the provisions of the Gas Company's draft Order. For instance, a proposal might be put forward for the laying of a gas main which might affect a number of level crossings and bridges. Before prescribing the conditions under which the work was to be carried out he would want to consider how the working of the railway would be affected and how the proposed works would interfere with the structures of bridges. The Gas Company did not know the structures of the bridges, and sometimes the plans in his possession did not show correctly the construction of a bridge, and it was necessary to open up the roadway in order to find out. Further, a railway engineer might be giving urgent attention to other matters affecting safety on the railway, and might not be able to give immediate attention to the Gas Company's proposals. If a gas main were to be laid under an electrified line it would be necessary to prescribe conditions. The live rail would have to be disconnected, and this was quite a job in itself, for copper bonds had to be cut out and fish plates taken off, and the disconnected parts of the live rail would be re-connected by means of a cable. All this work had to be done by skilled men.

Mr. RONCA asked if there was a live rail over a level crossing.

*Witness* said there was usually a cable there, but it was necessary to ensure that the gas main was laid at such a depth that it would not affect the cable, and to prescribe specific conditions. In such cases it was essential that the Railway Company should have the right to carry out the work itself (other than the actual laying of the main) if it desired. It would be necessary also to have a skilled inspector present to see that all proper precautions were taken during the carrying out of the work so as not to interfere with traffic. The general law did not make it obligatory for the Gas Company to give the Railway Company a section of the works; but only a plan; it was desirable that a section should be submitted as well as the plan.

Emphasizing the vital necessity that the Railway Company should have the right itself to carry out the works at level crossings, he pointed out that there were both high-pressure and low-pressure electricity mains at the crossings; there might be mains carrying pressures up to 10,000 volts, as well as those at the ordinary working pressure of 660 volts.

The provision of watchmen and of temporary lighting where necessary was as important for the safety of the Gas Company's men as for the safety of the railway and the travelling public. Under the Act of 1847, as he read it, the Railway Company could not recover the expenses incurred in respect of watching, lighting, &c., and it now asked for power to recover the reasonable costs.

Mr. ABADY, cross-examining, asked what watching or temporary lighting would be required when a main was being laid in the highway of a bridge carrying a road over the railway.

*Witness* said he had not suggested the necessity would arise in that case, but it might be necessary if a pipe were being carried outside the structure of the bridge and when anything might drop on to the railway.

COUNSEL replied that the Gas Company could only carry out such work by agreement with the Railway Company, as provided by the general law.

Mr. BURY, addressing Mr. Ronca, said this was the first time a protective clause had been refused by a gas company to a railway company; he produced about a dozen Orders made by the Department, each of which contained a clause for the protection of the Railway Company, and said he believed the clause was inserted by agreement in each case. He did not know what peculiar circumstances there were which prevented the Rochester Gas Company acting as others had done in many cases before.

Dealing with the reasons why the Railway Company had not secured a protective clause relating to the existing area earlier, he said the Gas Company had come into being in 1825, which was long before railways were built in Kent. The Gas Company's Act of 1867 repealed the 1825 Act and regularized the Gas Company's legal position. It might be said that the Railway Company—which had come into existence in 1840—should have secured protection in the 1867 Act of the Gas Company, but he could not see how that could have been done, for the Railway Company would not have been allowed a *locus standi* to ask for special protection in a Consolidation Act. Further, by reason of electrification, a new state of affairs had arisen in the railway world in recent years, and the protection now asked for was essential.

Mr. RONCA asked why, if special powers were necessary in view of electrification, the Railway Company had not secured that power in their own Act.

Mr. ABADY said they might also have asked Parliament for special protection in 1920, when the Gas Company was in Parliament.

Mr. BURY said he was not fully instructed on the matter, but probably the Railway Company had thought that, inasmuch as they were granted protective clauses when they had asked for them, it would not be necessary to do other than they had done in the past in this respect. The Gas Company's objection to the insertion of the clause was that it involved an alteration of the general law; he quite agreed that it did; but so did all the other clauses which had been inserted in various Orders by agreement. The Gas Company feared that if the clause were inserted they might have to pay rather more than they did under the general law under certain circumstances. Was it not fair, however, that when the Railway Company had to go to the expense of putting in temporary lighting, or watching the line in the interests of safety, cutting out live rails, or altering the attachment of cables, and so on, it should be recompensed? That, and the right to carry out the work itself where they considered that course to be desirable, was all the Railway Company was asking for.

Mr. ABADY, dealing with Mr. Bury's suggestion that if the Railway Company had opposed the Gas Company's Bill in 1887 they would not have had a *locus standi* because the Bill was a consolidation Bill, said that although that Bill had dealt with the constitution of the Company, which had been in existence since 1825, it did in fact provide also for the extension of the limits of supply, and in that sense it was not a consolidation Bill. He was perfectly certain that the Railway Company could have asked for protection then.

The inquiry then closed.

# Watford and St. Albans Gas Order.

Mr. J. F. RONCA (Director of Gas Administration) held an inquiry at the Board of Trade Offices, Great George Street, Westminster, S.W. 1, on Monday, May 26, into the Application of the Watford and St. Albans Gas Company for a Special Order under the Gas Undertakings Acts of 1920 and 1929. The main purpose of the Order is to authorize the amalgamation of the Watford Company with the Elstree and Boreham Wood Gas Company, Ltd., on terms which have been agreed, and to bring the legislation applying to the two Companies into conformity.

The Watford Company was represented by Mr. H. ROYSTON ASKEW, and there were present in support of the Order Mr. Frank H. Jones (Chairman of the Watford Company), Mr. George Evetts (Consulting Engineer for the Company), and the Secretaries and Engineers of the Watford and Elstree Companies.

There were objections to the terms of the Order by the Herts. County Council, the Watford Corporation, the Watford Rural District Council, and the Bushey Urban District Council.

Mr. ASKEW (Counsel for the Promoters), explaining the proposals of the Order, said that the areas of supply of the two Companies adjoined, and, indeed, the area of the Elstree Company projected into the Watford Company's area. The effect of the amalgamation would be to round off the boundaries of the two Companies' areas and form a convenient and workable area. The amalgamation had been considered, of course, from both points of view. The result of it would be to give the Watford Company a larger scope and a larger unit, and the Elstree area, which was rapidly developing and in which the outlay necessary for the development of the supply of gas would be considerable in the next few years, would have advantage of the larger resources of the Watford Company. Thus, the consumers of both areas would benefit. The financial terms of the amalgamation were in the standard form in which scores of amalgamations of public utility companies had been carried out in recent years. The loan capital of the Elstree Company was to be taken over by the Watford Company, and the holders of preference and ordinary shares in the Elstree Company were to be given shares in the amalgamated Company to yield to them the same dividend as they were receiving on their shares in the Elstree Company.

The terms of exchange set out in the draft Order were as follows:

> For each original ordinary "A" £10 share in the Elstree Company, £18 9s. of "B" consolidated stock of the Watford Company;
>
> For each ordinary "B" £10 share of the Elstree Company, £12 18s. "B" consolidated stock of the Watford Company;
>
> For each 6½ p.ct. £10 preference share of the Elstree Company, £13 of 5 p.ct. preference stock of the Watford Company;
>
> For each 6 p.ct. £10 preference share of the Elstree Company, £12 of 5 p.ct. preference stock of the Watford Company;
>
> For each 5 p.ct. £10 preference share of the Elstree Company, £10 of 5 p.ct. preference stock of the Watford Company.

Thus, said Counsel, there was to be a straightforward conversion of the shares of the one Company into the shares of the other, and on the face of it the terms were both equitable and reasonable.

As the result of the amalgamation the Engineer and Secretary of the Elstree Company would retire from office, and the usual standard provision was made with regard to compensation for loss of office, the amount of compensation to be agreed upon or, failing agreement, to be settled by arbitration. The Accountants of the Elstree Company would also retire, and they were to receive three years' fees, in accordance with well-known precedents. The Directors of the

Elstree Company would receive, on retirement, seven years' fees. These provisions followed innumerable precedents and were regarded as just and fair. As the result of the amalgamation, if the Order were passed in the form proposed, the authorized and issued share capital of the combined undertaking would be equal to the sums of the existing authorized and issued share capitals of the separate Companies, no additional capital being asked for. It was proposed, however, that the borrowing powers should be increased by authorizing the combined Company to borrow up to 60 p.ct. of the issued share capital. In this connection Mr. Askew pointed out that the Gas Undertakings Act of 1929 permitted the gas companies, with the sanction of an Order from the Board of Trade, to borrow to the extent of 100 p.ct. of their issued share capital; he submitted, therefore, that the request for power to borrow up to 60 p.ct. of the issued capital was extremely reasonable. The effect of the increased borrowing powers asked for would be to raise the combined Companies' total borrowing powers by £77,000. It was estimated that rather more than that amount would be required to meet the developments which would take place in the Elstree district alone in the next twelve years. He recalled that an Order had been granted to the Watford Company in December of last year, giving further powers, but the money that would be raised under the terms of that Order would all be required for the development of the Watford and St. Albans areas.

The existing selling price of the gas supplied by the Elstree Company was 13d. per therm, and the selling price in the Watford district was 9¼d. per therm, so that the difference was 3¾d. It was proposed, if the amalgamation was sanctioned, to reduce the price in the Elstree area immediately by ¼d. per therm. Further, the Chairman of the Company anticipated that in the next five years the price in the Watford area would fall to the total extent of ¼d., and the price in the Elstree area would fall to the same extent. Thus, the consumers in the Elstree Company's area would receive an advantage of a reduction in price of 1d. per therm by the end of five years, provided the price in the Watford area was reduced as anticipated. The Order proposed a differential price of 3d. per therm as between the two areas. This matter had been considered from all points of view, and it was considered fair and just to both areas.

With regard to the objections, the local authorities concerned naturally regarded the proposal with regard to differential price from their own point of view. There were eleven local authorities to whom notice of the promotion of the Order had been sent; of these, five were wholly in the Watford Company's area, four were wholly in the Elstree Company's area, and two had interests in both areas. Seven of the eleven local authorities, however, had raised no objection whatever, and only four of them had raised objections with regard to the differential. The Watford Corporation and the Bushey Urban District Council, both of whose districts were within the Watford Company's area, had expressed some apprehension that the proposals would injure consumers in the Watford Company's existing area. The Herts. County Council, which was interested in the whole of the Watford Company's area and in part of the Elstree Company's area—their interests were infinitely larger in the Watford Company's area, the relative sizes of the two Companies' areas being approximately 15 to 1—suggested that the differential ought to be extinguished gradually over a period, and appeared to be concerned that the proposed differential was too high from the point of view of the Elstree consumers. The Watford Rural District Council, which was interested mostly in the Watford Company's area, and which was concerned with only a small part of the Elstree area, had made a very unusual statement in their objections. They had stated that there should be no differential, apparently regardless of the fact that at present the differences in the selling prices of gas in the two areas is 3¾d. per therm. The whole of the remaining local authorities concerned with the interests of the consumers in the Elstree district had made no objections whatever. It would appear that to some extent the objections made to the proposed differential were mutually destructive; the fact that opposite views were taken appeared to justify the Company's view that the proposals were fair and just to the consumers in the two areas.

A clause in the Order proposed to convert the existing "A" stock of the Watford Company into "B" stock and preference stock, the arrangement being that for every £100 "A" consolidated 5 p.ct. stock there should be exchanged £100 "B" consolidated stock and £30 of 5 p.ct. preference stock. There was only £14,800 of "A" stock outstanding, and it had been found very inconvenient to have that small amount of a separate stock. The proposed conversion would make the stock more marketable and would reduce costs of book-keeping. The proposal followed the precedents of the Tottenham Gas Act of 1928, and there was no opposition to it.

Dealing with the objections to the Order, Counsel said that the Herts. County Council raised objections to a clause the object of which was to repeal two sections of the Elstree Orders of 1904 and 1919 and to substitute for those a section of the Watford Gas Act of 1906. All these sections provided protection for the County Council. The two sections of the Elstree Orders which it was proposed to repeal were contradictory so far as they related to the opening of trenches. Apart from that, however, he contended that they were contrary to the terms of the general law, and were unreasonable. The Elstree Company were a small Company, with comparatively small resources, and no doubt they had consented to these unreasonable and onerous provisions in order to save opposition to their Orders. It was contended that there was no justification for the imposition of these provisions upon the amalgamated Company. For instance, it was provided that the Elstree Company should compensate the County Council for damage or loss or expenses which the County Council might sustain by reason of the bursting or giving way of any mains, pipes, or other works. That placed upon the Company an unconscionable burden, and it was at variance with general law as to the reponsibility of statutory undertakers, by which they were not liable to damages resulting from the bursting of their mains except in the event of negligence on their part. The 1906 Act of the Watford Company contained provisions for the protection of the Herts. County Council, and under the present Order those provisions would continue to apply in the Watford area and would apply also in the Elstree area. In 1920, the Watford Company had applied to the Board of Trade for a Provisional Order, and on that occasion the County Council had asked for further protection in respect of their roads, on the ground that the protection afforded by the 1906 Act was out of date and insufficient; the County Council had sought to put upon the Watford Company the obligations which they had been able to put upon the Elstree Company, but the Board of Trade had refused to give the County Council any further protection. Parliament had also refused to give the County Council protection beyond the provisions of the 1906 Act. He contended that the County Council could not show that since 1920 any new factors had arisen which would entitle them to further protection.

There was an objection by the Watford Corporation to a clause in the Order which provided for the payment of dividends on the Elstree shares in respect of the short period from the last payment up to the date of transfer. The Corporation asked that the dividends which the Elstree Company should be allowed to pay in respect of that period should not exceed the dividends paid in the preceding half-year. The Company took the view, however, that such a limitation of the existing rights of the Elstree Company would be most unfair. They had in recent years fully earned the dividends they had paid, and he believed that such a limitation as the Corporation sought to impose had not been imposed upon companies concerned in other amalgamations. The Watford Corporation also raised objections in regard to a clause which provided for the handing over of the Elstree capital to the Watford Company. Among other things, it provided that the premiums received in the past by the Elstree Company should be transferred to the Watford Company. This was a machinery clause, and was in the standard form. The Corporation suggested that the premiums should not be added to the capital of the undertaking, but he was not sure what grounds the Corporation could possibly have for that observation.

Another clause to which the Corporation objected was one authorizing the Company to offer capital for subscription, with the approval of the Board of Trade, and subject to such conditions as the Board might impose, and to pay a commission not exceeding 5 p.ct. This followed a number of precedents. The Corporation pointed out that there was no provision in the clause as to the price at which stock was to be issued, and that there was no justification for the clause. It also stated that the Company's stock was not quoted on the Stock Exchange, and that 5 p.ct. commission was too much. As a matter of fact, however, the stock was quoted in the Supplementary List. It was the desire of the Company to remedy a defect in the Company's Order of 1929, a clause in the 1929 Order being intended to give the Company power to offer capital by subscription, but in fact it did not.

Mr. R. F. PARKER (for the Watford Corporation) said he presumed that the 1929 clause did not get rid of the Auction clause.

Mr. ASKEW agreed.

Mr. PARKER replied that that was his point.

Mr. ASKEW said it was intended to do that, but in fact it did not. He added that the Corporation appeared to have overlooked that under the new clause stock could be issued by subscription only with the consent of the Board of Trade and subject to the conditions imposed by the Board.

The Watford Corporation also objected to the proposals to increase the borrowing powers, and was the only local authority which raised objections to the proposed compensation to the Directors of the Elstree Company, the view of the Corporation being that the proposed compensation was excessive, and that the Directors should be entitled only to the fees which they would have received up to the date when they next offered themselves for re-election. Mr. Askew expressed the belief that that suggestion had never been made before the Board of Trade; the principle of the clause had been recognized by Parliament again and again, not only in private Acts but also in the Acts of semi-public bodies such as the Metropolitan Water Board and in the Railway Acts. Precedents in Gas Acts for seven years' fees went back at least to 1908, and he believed even further. Again, the Corporation were the only objectors to the proposed compensation to the Secretary and Engineer of the Elstree Company, and suggested that the compensation should be paid on the Treasury scale.

Mr. PARKER said that he did not press for the Treasury scale, but the Corporation did suggest that the amount of compensation should be stated definitely at this stage.

Mr. ASKEW said that the Company had no objection to giving that information if it was required.

Another objection of the Corporation related to the proposed amendment of a section of the Watford Company's 1924 Order, concerning the qualification of Directors. The clause in the 1924 Order provided that Directors must disclose to the Board any interests they might have in contracts placed by the Company, and also that their interests in such contracts should be disclosed in the next annual report to the shareholders. It was now suggested by the Company that it should not be necessary to disclose such interests in the annual reports to shareholders. Previously, he believed, there were inserted in one or two enactments clauses such as that in the Company's 1924 Order; but in recent Gas Acts the necessity for disclosing Directors' interests in the annual reports to the shareholders had not been included. It had been regarded as invidious that a special entry should be made in the annual reports on matters which had already been disclosed to the Board, and that disclosure to the Board should be sufficient.

Objection was raised also to clauses which would enable the Company to enter into agreements with gas companies supplying any adjacent areas, subject to the approval of the Board of Trade, signified in writing under the hand of the Secretary or an Assistant Secretary of the Board. The Watford Corporation suggested that those clauses should be deleted from the Order.

Mr. RONCA said that Parliament had given the Board power to approve arrangements between adjacent companies, and he gathered

**[Continued on page 838.]**

## STOCK AND SHARE LIST.

[For Stock Market Report, see earlier pages.]

| Issue. | Share. | When ex-Dividend. | Dividends. Prev. Hf. Yr. | Dividends. Last Hf. Yr. | NAME. | Quotations. June 13. | Rise or Fall on Week. | Transactions Lowest and Highest Prices During the Week. |
|---|---|---|---|---|---|---|---|---|
| £ | | | % p.a. | % p.a. | | | | |
| 171,978 | Stk. | Feb. 6 | 5 | 5 | Aldershot 5 p.c. max. C. . | 73—78 | .. | .. |
| 522,992 | ,, | ,, | 4 | 4 | Do. 4 p.c. Pref. . . | 70—73 | .. | .. |
| 1,551,868 | ,, | Apl. 3 | 7½ | 7½ | Alliance & Dublin Ord. . . | 94—97 | .. | 94—95 |
| 374,000 | ,, | Jan. 9 | 4 | 4 | Do. 4 p.c. Deb. . . . | 60—63 | .. | .. |
| 522,655 | ,, | Mar. 6 | 7 | 7 | Barnet Ord. 7 p.c. . . . | 109—112 | .. | .. |
| 300,000 | 1 | Apl. 24 | 1/4½ | 1/7½ | Bombay, Ltd. . . . . | 16/6—18/6 | .. | .. |
| 174,500 | 10 | Mar. 6 | 9 | 9 | Bournemouth 5 p.c. . . . | 14—15 | .. | .. |
| 500,050 | 10 | ,, | 7 | 7 | Do. B 7 p.c. . . | 12½—12¾ | .. | .. |
| 439,160 | 10 | ,, | 6 | 6 | Do. Pref. 6 p.c. . | 10½—11½ | .. | .. |
| 50,000 | Stk. | Dec. 19 | 3 | 3 | Do. 3 p.c. Deb. . | 55—58 | .. | .. |
| 162,025 | ,, | ,, | 4 | 4 | Do. 4 p.c. Deb. . | 74—77 | .. | 75 |
| 357,900 | ,, | Mar. 20 | 7½ | 7½ | Brighton & Hove 6 p.c. Con. | 114—117 | .. | 116—116½ |
| 371,880 | ,, | ,, | 6¾ | 6¾ | Do. 5 p.c. Con. | 102—105 | .. | .. |
| 1,287,500 | ,, | Feb. 20 | 5 | 5 | Bristol 5 p.c. max. . . . . | 89—90*a* | +1 | .. |
| 855,000 | ,, | Apl. 3 | 7 | 8 | British Ord. . . . . | 110—115 | .. | 112 |
| 100,000 | ,, | Dec 19 | 7 | 7 | Do. 7 p.c. Pref. . . . | 115—120 | .. | .. |
| 120,000 | ,, | ,, | 4 | 4 | Do. 4 p.c. Red. Deb. . . | 72—75 | .. | .. |
| 450 000 | ,, | ,, | 5 | 5 | Do. 5 p.c. Red. Deb. . . | 92—95 | .. | 94 |
| 100,000 | ,, | Jan. 9 | 5 | 5 | Cambridge 5 p.c. Deb. . . | 94—97 | .. | .. |
| 100,000 | 10 | May 22 | 6 | 10 | Cape Town, Ltd. . . . . | 9—10 | +½ | .. |
| 100,000 | 10 | Apl. 24 | 4½ | 4½ | Do. 4½ p.c. Pref. . . | 6¾—7¼ | .. | .. |
| 150,000 | Stk. | Dec. 19 | 4½ | 4½ | Do. 4½ p.c. Deb. . . | 71—76 | .. | .. |
| 626,860 | ,, | Feb. 20 | 6 | 6 | Cardiff Con. Ord. . . . . | 96—99 | .. | .. |
| 237,860 | ,, | Jan. 9 | 7½ | 7½ | Do. 7½ p.c. Red. Deb. . | 98—101 | .. | .. |
| 157,150 | ,, | Feb. 20 | 5 | 6½ | Chester 5 p.c. Ord.. . . . | 88—93*b* | .. | .. |
| 98,936 | 1 | May 8 | 12/- | †2/- | Colombo, Ltd. Ord. . . . | 33/—35/- | .. | .. |
| 24,500 | 1 | ,, | 1/4½ | 1/4½ | Do. 7 p.c. Pref. . . | 18/6—20/6*b* | .. | .. |
| 375,402 | 1 | Apl. 3 | 1/9½ | 1/9½ | Colonial Gas Assn. Ld. Ord | 20/—22/- | .. | .. |
| 187,848 | 1 | ,, | 1/7½ | 1/7½ | Do. 8 p.c. Pref. | 19/—21/- | .. | .. |
| 2,073,280 | Stk. | Feb. 20 | 5 | 7 | Commercial Ord. . . . . | 90—93 | .. | 91½—92 |
| 475,000 | ,, | Dec. 19 | 3 | 3 | Do. 3 p.c. Deb. . . | 57—60 | .. | .. |
| 787,560 | ,, | Feb. 20 | 7 | 7 | Croydon sliding scale. . . | 105—108 | .. | 106¼—107½ |
| 453,100 | ,, | ,, | 5 | 5 | Do. max. div. . . . | 83—86 | .. | .. |
| 542.270 | ,, | Mar. 6 | 7 | 10 | Derby Con. . . . . | 115—125*e* | .. | .. |
| 55,000 | ,, | Dec. 19 | 4 | 4 | Do. Deb. . . . . | 67—70*e* | .. | .. |
| 209,000 | ,, | Mar. 6 | 5 | 5 | East Hull Ord. 5 p.c. . . | 71—73 | .. | 71½ |
| 1,002,180 | 10 | Mar. 20 | †4 | †7 | European, Ltd. . . . . | 12½—13¼ | .. | 12¾ |
| 18,629,125 | Stk. | Feb. 20 | 5½ | 5½ | Gas Light & Coke 4 p.c. Ord. | 18/9—19/3*f* | .. | 18/9—19/1½ |
| 2,600,000 | ,, | ,, | 3½ | 3½ | Do. 3½ p.c. max. . . . | 63½—65½ | .. | 65 |
| 4,157,020 | ,, | ,, | 4 | 4 | Do. 4 p.c. Con. Pref. . . | 77—80 | .. | 77½ |
| 5,602,620 | ,, | Dec. 19 | 3 | 3 | Do. 3 p.c. Con. Deb. . . | 59—62 | .. | 60½ |
| 2,642,770 | ,, | ,, | 5 | 5 | Do. 5 p.c. Red. Deb. . . | 99—102 | .. | 100—100¾ |
| 161,480 | ,, | Feb. 20 | 10 | 10 | Harrogate Cons. 10 p.c. max. | 158—163 | .. | .. |
| 82,500 | ,, | Mar. 20 | 7 | 7 | Hastings & St. L. 5 p.c. Conv. | 96—101 | .. | .. |
| 258,740 | ,, | ,, | 5½ | 5½ | Do. 3½ p.c. Conv. | 78—83 | .. | .. |
| 70,600 | 10 | May 22 | †10 | ‡ | Hongkong & China, Ltd. . | 13½—14¼ | .. | 14 5/16 |
| 213,200 | Stk. | Mar. 6 | 6 | 6 | Hornsey Con. 3¼ p.c. . . . | 90—93 | .. | 92 |
| 2,436,594 | ,, | May 22 | 10 | 25 | Imperial Continental Cap. . | 350—370 | −5 | 355—367 |
| 223,130 | ,, | Feb. 6 | 3¼ | 3¼ | Do. 3¼ p.c. Red. Deb. | 80—85 | .. | .. |
| 235,242 | ,, | Mar. 20 | 8½ | 8½ | Lea Bridge 5 p.c. Ord. . . | 123—128 | .. | .. |
| 2,145,907 | ,, | Feb. 20 | 6 | 6 | Liverpool 5 p.c. Ord. . . . | 91½—94½*b* | .. | .. |
| 600,000 | ,, | Mar. 20 | 7 | 7 | Do. 7 p.c. Red. Pref.. | 100—102*b* | .. | .. |
| 165,736 | ,, | Feb. 20 | 9 | 8 | Maidstone 5 p.c. Cap. . . | 119—124 | .. | .. |
| 63,480 | ,, | Dec. 19 | 3 | 3 | Do. 3 p.c. Deb. . . | 52—55 | .. | .. |
| 75,000 | 5 | Dec. 5 | †10 | †10 | Malta & Mediterranean . . Metrop'itan (of Melbourne) | 5½—6 | .. | .. |
| 392,000 | — | Apl. 1 | 5½ | 5½ | 5½ p.c. Red. Deb. . . . | 90—93 | .. | .. |
| 541,920 | Stk. | May 22 | †6 | †8 | Montevideo, Ltd. . . . . | 107—112 | .. | 107½—110 |
| 2,061,315 | ,, | Feb. 20 | 5 | 5¼ | Newcastle & Gateshead Con. | 16/3—16/9*df* | .. | .. |
| 682,856 | ,, | ,, | 4 | 4 | Do. 4 p.c. Pref. . | 70—71*d* | .. | .. |
| 691,705 | ,, | Dec. 19 | 3½ | 3½ | Do. 3½ p.c. Deb. . | 66½—67½*d* | .. | .. |
| 169,940 | ,, | Mar. 6 | 7½ | 7½ | North Middlesex 6 p.c. Con. | 109—114 | .. | .. |
| 396,160 | ,, | Feb. 6 | 5 | 5 | Northampton 5 p.c. max. . | 75—78 | +1 | .. |
| 300,000 | ,, | Apl. 24 | 9 | 7 | Oriental, Ltd. . . . . | 108—113 | .. | .. |
| 60,000 | 5 | 13 My., '15 | — | — | Ottoman . . . . . | 0—¼ | .. | .. |
| 205,162 | Stk. | Jan. 9 | 8 | 8 | Plym'th & Stonehouse 5 p.c. | 107—110 | .. | .. |
| 424,416 | ,, | Feb. 20 | 8 | 8 | Portsm'th Con. Stk. 4 p.c. Std | 110—115 | .. | .. |
| 241,446 | ,, | ,, | 5 | 5 | Do. 5 p.c. max. . . | 78—81 | .. | .. |
| 186,000 | 100 | June 2 | 4 | 4 | Primitiva 4 p.c. Red. Deb. . | 94—97* | .. | .. |
| 677,837 | Stk. | Jan. 23 | 4 | 4 | Do. 4 p.c. Red. Deb. 1911 | 81—84 | .. | .. |
| 371,496 | ,, | Dec. 19 | 4 | 4 | Do. 4 p.c. Cons. Deb. . | 81—84 | .. | .. |
| 150,000 | 10 | Apl. 3 | 6 | 6 | San Paulo 6 p.c. Pref. . . | 8½—9 | .. | .. |
| 1,736,968 | Stk. | Mar. 20 | 6½ | 6½ | Sheffield Cons. . . . . | 103—105*e* | .. | .. |
| 95,000 | ,, | Jan. 9 | 4 | 4 | Do. 4 p.c. Deb. . . . . | 76—78*e* | .. | .. |
| 90,000 | 10 | June 5 | ‡4 | ‡ | South African . . . . . | 4—6* | .. | .. |
| 6,709.895 | Stk. | Feb. 20 | 5 | 7½ | South Met. Ord. . . . . | 102—104 | .. | 102⅜—103½ |
| 500,000 | ,, | ,, | 6 | 6 | Do. 6 p.c. Irred. Pf. | 108—111 | +1 | 109—110 |
| 1,895,445 | ,, | Jan. 9 | 3 | 3 | Do. 3 p.c. Deb. . . | 58—61 | .. | 59½ |
| 734,000 | ,, | Mar. 6 | 6½ | 6½ | Do. 6½ p.c. Red. Db. | 99—101 | .. | .. |
| 91,500 | ,, | Mar. 20 | 8½ | 8½ | South Shields Con. . . . . | 106½—107½*d* | .. | .. |
| 1,543,795 | ,, | Feb. 20 | 6½ | 6½ | South Suburban Ord. 5 p.c. | 101—104 | .. | 101½—102½ |
| 468,827 | ,, | Dec. 19 | 5 | 5 | Do. 5 p.c. Deb. | 95—98 | .. | 95½ |
| 647,740 | ,, | Feb. 20 | 5 | 5 | Southampton Ord. 5 p.c. max. | 76—79 | .. | .. |
| 121,275 | ,, | Dec. 19 | 4 | 4 | 4 p.c. Deb. | 72—75 | .. | .. |
| 179,014 | ,, | Feb. 20 | 8 | 8 | Sutton Ord. . . . . | 113—116 | .. | .. |
| 67,828 | ,, | Jan. 9 | 5 | 5 | Do. 5 p.c. Deb. . . . | 93—96 | .. | .. |
| 250,000 | ,, | Mar. 6 | 7 | 7 | Swansea 7 p.c. Red. Pref. . | 98—100 | .. | .. |
| 200,000 | ,, | Dec. 19 | 6½ | 6½ | Do. 6½ p.c. Red. Deb. . | 99—101 | .. | .. |
| 1,076,490 | ,, | Mar. 6 | 6⅝ | 6⅝ | Tottenham District Ord. . | 102—106 | .. | .. |
| 150,000 | ,, | ,, | 5½ | 5½ | Do. 5½ p.c. Pref. . . | 97—100 | .. | .. |
| 199,005 | ,, | Dec. 5 | 4 | 4 | Do. 4 p.c. Deb. . . | 73—76 | .. | .. |
| 182,380 | 10 | 30 Dec., '12 | — | — | Tuscan, Ltd. . . . . | 3¾—4¾ | .. | .. |
| 85,701 | Stk. | Mar. 20 | 6 | 6 | Do. 6 p.c. Red. Deb. | 75—80 | .. | .. |
| 309,094 | ,, | Mar. 6 | 7 | 7 | Uxbridge, Maidenhead, & Wycombe 5 p.c. . . . . | 94—99 | .. | .. |
| 88,336 | ,, | ,, | 5 | 5 | Do. 5 p.c. pref. . . | 85—90 | .. | 90 |
| 1,180,970 | ,, | — | — | — | Wandsworth, Wimbledon, and Epsom Cons. . . | 108—113 | .. | .. |
| 200,000 | ,, | Feb. 20 | 5 | 5 | Do. 5 p.c. Pref. . . . . | 87—92 | .. | .. |
| 488,344 | ,, | Dec. 19 | 5 | 5 | Do. 5 p.c. Deb. . . . . | 95—98 | .. | .. |

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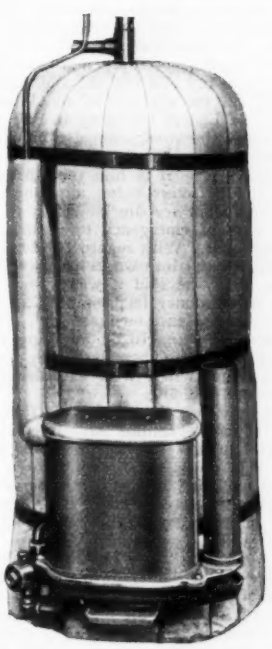

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the point raised was whether the Board had power to approve arrangements by signature, or whether it could approve them only by means of Special Orders.

Mr. ASKEW said that the clauses were designed to authorize the joint working of neighbouring authorized gas undertakings in the interests of efficiency in gas manufacture and supply, always with the approval of the Board of Trade, and it was surprising that such provisions should be objected to by the local authorities, because in the case of sliding-scale companies such arrangements must be to the benefit of the consumers. The arrangements contemplated under the clauses were such as those contemplated under section 10 (2) (*d*) of the Gas Regulation Act, and he held that the Board of Trade had power to grant the clauses in the Order by signature.

Mr. *George Evetts* (Consulting Engineer to the Watford Company) gave evidence in support of the Order, and said he had submitted to the Board of Trade a detailed statement of the capital of the combined undertaking and the requirements in connection with the amalgamation. He had estimated that the capital requirements in Elstree alone for the next twelve years would be £81,100, but the increased borrowing powers asked for in the Order amounted to £77,000. The developments in the Elstree area were very extensive, and the indications were that development throughout the whole of the district would be very rapid. The Elstree shareholders would receive Watford Company's stock to yield the same dividend as they had been receiving, and he pointed out that whereas the Elstree Company had been authorized to pay a dividend of £13 15s. p.ct., they had in fact paid only £12 p.ct. on the original and additional stock.

The price of gas in Watford must be reduced annually in steps of 0·1d. per therm, so that in five years it would be equal to the price in St. Albans. The price in the Elstree area would also be reduced to the same extent, in addition to the reduction of ½d. per therm, which would be made immediately after the transfer. Justifying the differential price of 3d. per therm, as between Watford and Elstree, he gave detailed figures of the costs of supplying the two areas, first on the assumption that the Elstree works would continue to be used for manufacture, and, secondly, on the assumption that gas would be supplied in the Elstree area by means of a new main from the Watford works, and he concluded that the differential could not be less than 3d. per therm without imposing an unfair burden upon the consumers in the Watford area.

With regard to the Watford Corporation's contention that the Elstree Company should not be allowed to pay, between the end of the preceding half-year and the date of transfer, a larger dividend than was paid in the preceding half-year, he said he was told that the Elstree Company had not the slightest intention of paying a higher dividend. At the same time, the Watford Company did not intend to fetter the Elstree Company in any way. As to the clause which would enable the amalgamated Company to offer stocks for subscription, and to pay commission, subject to the approval of the Board of Trade, it seemed to him that the Board had sufficient power to prevent the Directors doing anything silly, even if they wished to, and he could not see any objection to the clause. It was probably only in case of emergency that the Company would wish to take advantage of it. With regard to the clauses which would enable the Company to enter into working agreements with companies supplying adjacent areas, he said it was desirable that companies should not have to spend money in promoting an Order every time they wanted to do a common-sense business deal. Unless the Directors were fools they were not going to do anything to jeopardize the shareholders or the consumers. They should be credited with ordinary commonsense, and the clauses were exceedingly useful to anyone with business ability.

Mr. R. F. PARKER (for the Watford Corporation) said he did not propose to cross-examine Mr. Evetts with regard to the proposed differential price. The Watford Corporation at the time they had lodged their objections, had not been satisfied that the differential was sufficient, and they still considered it was slightly deficient; but the difference between it and the Company's proposal was so small that on further consideration they did not wish to press the matter further. With regard to the Elstree Company's dividend, he said they had not in fact paid as high a dividend as they would be able to pay for the period between the end of the preceding half-year and the date of transfer if the proposal in the Order were granted. He also pointed out that the Company had not had their standard price revised since 1922.

Mr. *Evetts* replied that the standard price was a very low one, and he repeated the statement made to him by the Engineer of the Company that it was not intended to pay a higher dividend than it had so far paid.

Mr. PARKER, dealing with the proposed transfer of the premiums which had been received by the Elstree Company to the Watford Company, said it was a proposal to capitalize those premiums, and to some extent that was an alteration of the capital.

Mr. *Evetts* said he did not think that was right.

Mr. PARKER: You agree with the Watford Corporation?

Mr. *Evetts* said he did; and added that he did not think it mattered; as a matter of purity of accounting he would leave it out.

Mr. PARKER, referring to the proposal to offer new stock for subscription and to pay commission, said that if the clause were granted it would enable the Company to ignore the Auction Clauses altogether. He asked if Mr. Evetts could see any reason to suppose that the Watford Company would ever be in difficulty in raising capital under the Auction Clauses.

Mr. *Evetts* replied that he did not.

Mr. PARKER said that under the powers of their Order of 1924 the Watford Company had to offer all the capital by auction in the first place, and if that failed at the first attempt the Company could adopt the subscription procedure in lieu of, or in addition to, offering stock to consumers and employees.

Mr. *Evetts* said he quite appreciated that there were times when the power proposed in the present Order, to offer for subscription, would be extremely useful; instead of having to broadcast prospectuses at great cost, it might be easier to dispose of a whole block to one person on a 5 p.ct. commission basis. He considered that would be a very useful second string.

Mr. PARKER: Not a first string?

Mr. *Evetts:* Not necessarily a first string.

Mr. PARKER asked what were the combined unexercised capital powers of the Watford and Elstree Companies.

Mr. *Evetts* said they amounted to £329,397.

Mr. PARKER said that, with the £77,000 increased borrowing powers sought under the Order, the Company would have power to raise approximately £400,000, and suggested that that was a large figure.

Mr. *Evetts* said that the Watford Company had had their capital powers dealt with by the Board of Trade in 1929, and he assumed that the Board had been satisfied at the time that the powers given to the Company were justified by the requirements of the existing Watford Company's area. The £77,000 would be required for the Elstree area alone during the next twelve years.

Mr. *J. H. Jones* said he had been on the Board of the Watford Company for 25 years, and was now Chairman and Managing Director of the Company. The advantage to Elstree under the present scheme was that it would receive cheaper gas immediately, but although the Watford undertaking would have an immediate increase in output of 60 million c.ft. per annum there would be no great immediate benefit to the Company as a result of that. Indeed, the Watford Company would probably get that same increase in their own area within a very few years, and the Company would really not mind if the amalgamation scheme did not go through. At the same time, his Board had consented to the proposal believing that in course of time there would be advantages both to Watford and St. Albans and to Elstree from the economies resulting from combined management. Dealing with the objections to the compensation proposed to be paid to the Engineer and the Secretary of the Elstree Company, Mr. Jones said he did not wish to state publicly what these gentlemen were drawing by way of salaries. The salaries, however, were very moderate, and in the case of the Engineer it was proposed to pay ten years' salary, and in the case of the Secretary, seven years' salary. As regards compensation to the retiring Directors, that would be on the basis of seven years' fees of £525 per annum, these being the fees of three Directors, a fourth Director not receiving any compensation.

Cross-examined by Mr. Windsor on behalf of the Hertfordshire County Council, Mr. Jones said he could not visualize the time when the Watford Company, under the amalgamation scheme, would be able to reduce the differential of 3d. as between Watford and St. Albans and Elstree. He was certain, he added, that it would have to continue for a very long time; but nevertheless, the Elstree consumers would get the benefit, with the Watford consumers, of any reductions in price, although the differential of 3d. would remain.

Mr. WINDSOR suggested that a period of years should be stated in the Order during which the differential should remain, after which it should disappear, and that if at the end of that time the Company felt it impossible to remove the differential, then they should apply to the Board of Trade for an extension.

Mr. *Jones* objected to that, and replied that as the Watford Company would undoubtedly be either before Parliament or the Board of Trade in a few years, any local authority could then raise the question of the differential.

On behalf of the Bushey Urban District Council objection was taken to what are known as the joint working clauses, which are clauses 49 to 53 in the draft Order and permit of joint working between undertakings, investing in other companies, &c., and the point was made that the Board of Trade would be acting illegally in allowing such clauses. The opinion was expressed that if challenged in the Courts such clauses could not stand, inasmuch as they are an extension of the powers granted under the Gas Regulation Act. The Director was, therefore, asked to consider very carefully whether these clauses could be retained in the Order. On the matter of the differential price in Elstree, the Bushey Council offered no objection.

Mr. *Jones* said he would much prefer the joint working clauses to the clauses in the Gas Regulation Act.

Mr. WINDSOR, on behalf of the Hertfordshire County Council, then addressed the Director, but did not call any evidence. As regards the differential, he asked that a definite period of years should be fixed during which the differential would gradually disappear, leaving it to the Company to ask the Board of Trade to extend the period if need be later. Having carefully considered the matter, the Hertfordshire County Council were not prepared to suggest a period, but were content to leave it in the hands of the Board of Trade. As to clause 17, this asked for the repeal of a protection given by the Elstree Company to the County Council, and he objected to that. As the Watford Company had purchased the Elstree Company with all their obligations, those obligations should be honoured, and it should not be for the Company, having fixed the purchase price on the basis of those obligations, to come to the Board of Trade and ask to be relieved. There was no suggestion that the clause had acted harshly upon the Elstree Company or that it had proved in any way unreasonable, and he resisted the proposal for its appeal.

Mr. PARKER said his clients were satisfied on the question of the differential price, but they objected to anything in the proposed amalgamation which would permit of higher dividends being paid on the Elstree capital than were now being paid. Furthermore, his Council contended that the proposed new capital powers of £77,000 were not justified in present conditions, and they also objected to the compensation which it was proposed to pay the Engineer and Secretary of the Elstree Company.

Mr. *Jones* said that the compensation to be paid to these two officials would not make any difference in the price of gas, and had they joined the staff of the Watford Company they would have come on to that Company's pension scheme and would, in due time, have been compensated from that fund.

As the opponents called no evidence there was no right of reply by Counsel on behalf of the Watford Company, and the Director will give his decision in due course.

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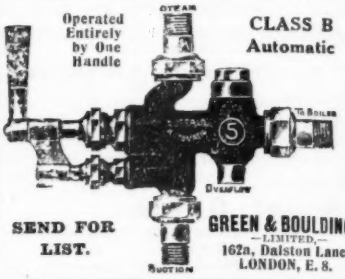

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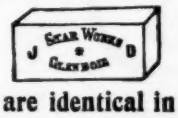
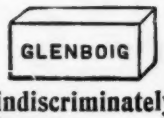
REGISTERED 

TRADE 

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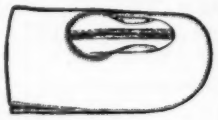

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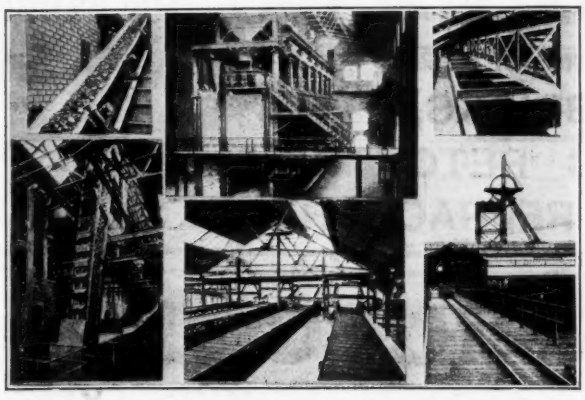

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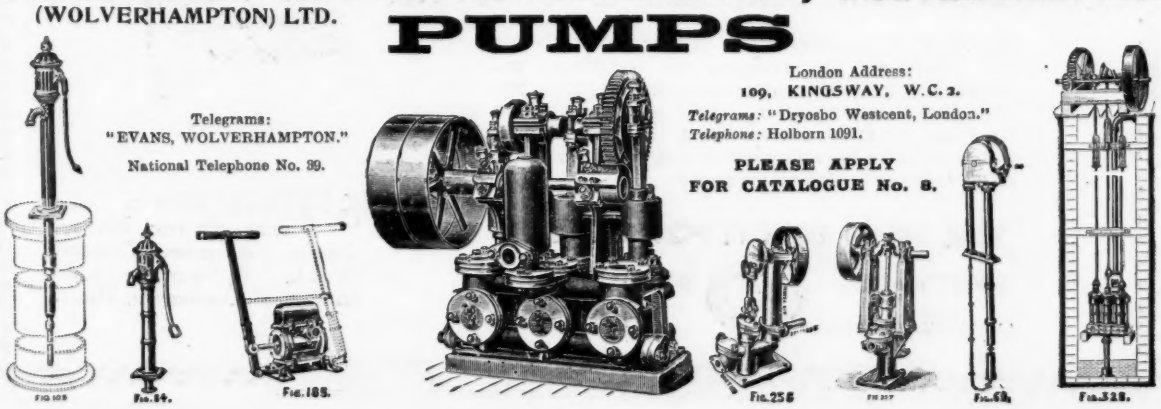

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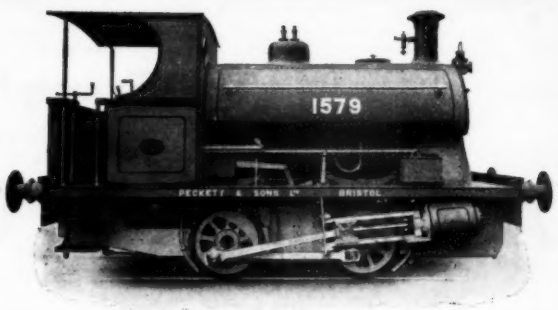


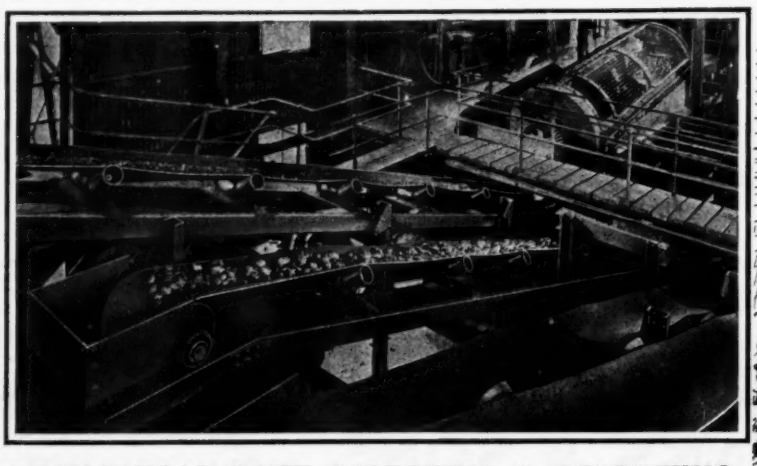

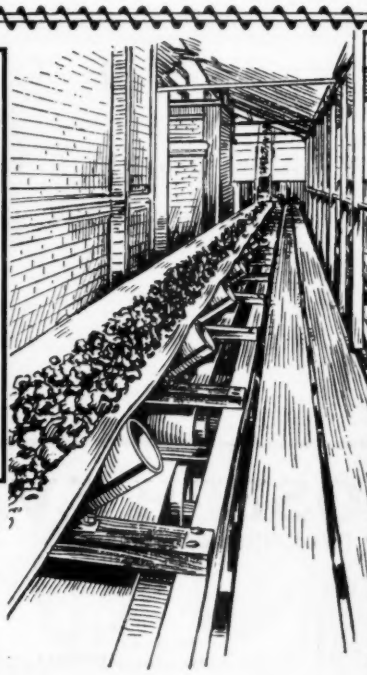

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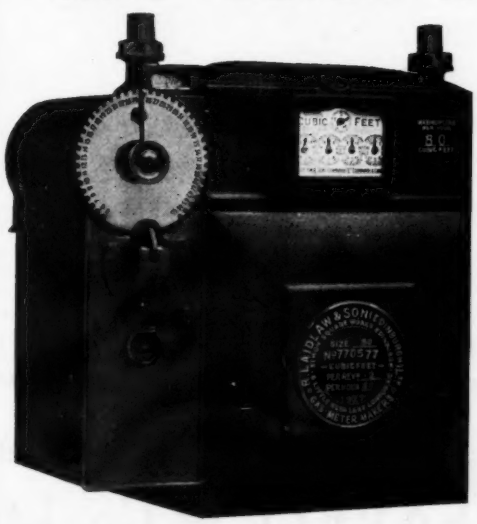


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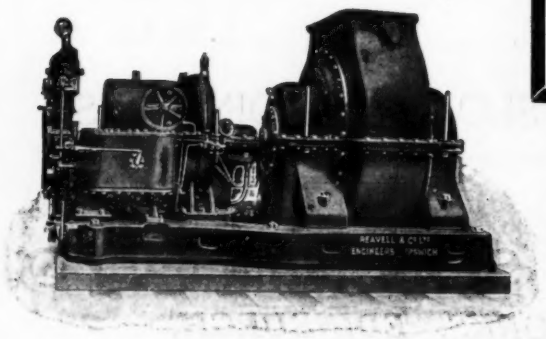

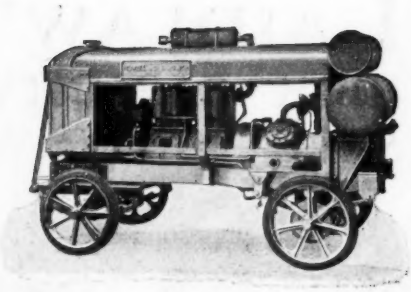

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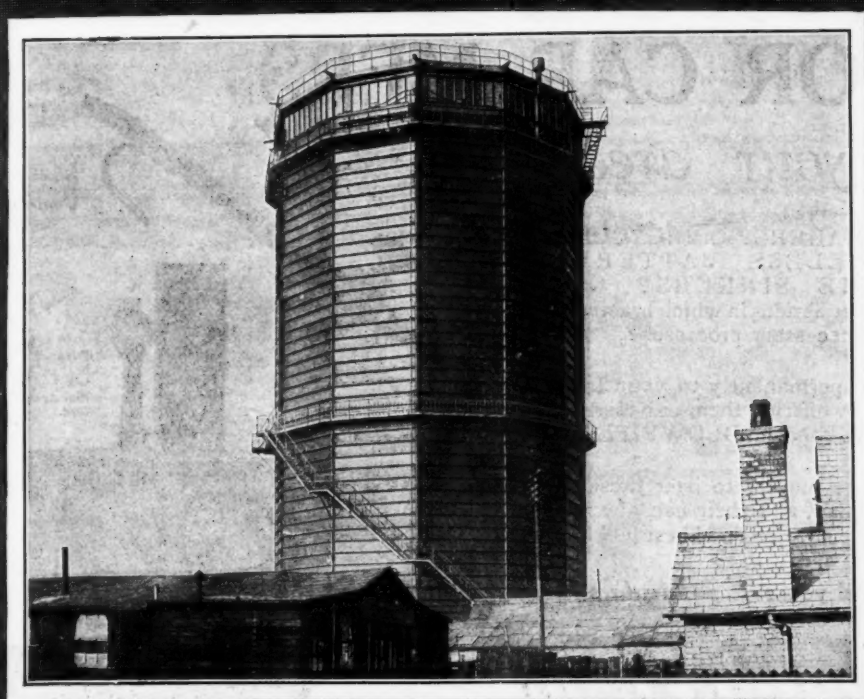

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